Soil carbon sequestration – lifeline or lead boots?

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There are two major policy proposals in Australia designed to reduce national greenhouse gas emissions. The first is the much-discussed Carbon Pollution Reduction Scheme (CPRS) that would impose a cost on emissions, and which has been limping toward the legislative finish line for what seems like an eternity. The second, a late entry to the race, is the Coalition’s ‘Direct Action’ policy, which instead of penalising emitters, relies heavily on offsets in the form of soil carbon and forestry to achieve future emission targets.

The finishing line in this race may not even be reached after the forthcoming Australian elections, but it is edging ever closer. Meanwhile, for the agriculture sector there is a lot to consider. Both sides of politics have committed to future climate policy action, and agriculture features prominently in both sets of plans. Both policy proposals contain provisions for emission offsets, particularly through soil carbon sequestration.

But how realistic is it to expect Australian farmers to be able to store carbon in soils? What sequestration rates can be achieved? What impact would there be on farm profitability if a farmer chooses to provide offsets through soil carbon? How long would farmers have to ensure soil carbon levels are maintained, and what happens during a drought?

This article attempts to provide answers to some of these questions by analysing existing literature on soil carbon sequestration under Australian conditions. It also provides the results of some preliminary financial modelling to obtain an idea of the likely impact for farmers of adding soil carbon offsets to the range of enterprises they carry out on their farm. The results highlight that one size does not fit all when it comes to Australian agriculture and that selling soil carbon offsets may not be a winning strategy for all farm enterprises.

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Out and about

Recently the Institute’s Executive Director, Mick Keogh, has spoken at:

- AARES Conference, Adelaide
- LiveCorp/ALEC Conference, Canberra
- GRDC Southern Updates: Ballarat, Victoria and Wagga Wagga, NSW
- Suncorp Agribusiness Annual Conference, Sydney
- GRDC Northern Grower Update, Gunnedah, NSW
- Goondiwindi GRDC Advisor Update, Queensland
- Facey Group Grain Trials Presentation Evening, Wickepin, WA
- SEPWA Harvest Debrief and AGM, Esperance, WA
- GRASS Group Conference, Gulargambone, NSW
- National Rural Independents Annual Conference, Melbourne
- Gwydir Valley Irrigators Association Meeting, Moree, NSW
- Young Rural Leaders Forum, Hamilton, Victoria
- Lithgow Community Meeting on Greenhouse Policy, NSW
- Farm 500 Annual Conference, Warremarang, Victoria
- Australasian Milling Conference, Melbourne
- Queensland Primary Industries Week, Brisbane
- Charles Sturt University, Orange – Annual Agricultural Forum, NSW

In the news

Mick Keogh’s feature article from the January newsletter provided the basis for the ABC Rural article, ‘Less meat less heat’ (2/02/2010), and Matt Cawood’s The Land article, ‘Less meat, less heat climate argument flawed’ (7/02/2010). Mick also wrote an opinion piece in Queensland Country Life titled, ‘Does the ABC hate stock producers’, commenting on a recently screened Lateline program on the subject of the chicken industry – pointing out a number of unsubstantiated and incorrect statements included within the program (1/04/2010).

The subject of the upcoming May Journal, ‘What If I was the Australian Minister for Agriculture’, was discussed in the ABC Rural article, ‘Be a pollie and show us your policy’ (10/02/2010). With Mick quoted as saying that, ‘We’re looking for ideas that will help the sector, and perhaps they’re ideas that haven’t been tried yet or perhaps they’re slightly different to what’s being done at the moment.’

The February Journal was featured in Matthew Cawood’s article for Country News, ‘Bushfire response should be prevention’ (29/03/2010). Mick also provided comment on the UN carbon accounting systems with regard to bushfires in Ean Higgins’ article from The Australian, ‘Feral camels clear in Penny Wong’s carbon count’, noting ‘that while emissions from a deliberately lit bushfire count under Kyoto, they did not if the fire was caused by lightning’ (8/02/2010).

Asa Wahlquist’s article from The Australian, ‘A hand up, not a handout’, included comments from Mick about the need for tax incentives for drought preparation and additional sources of income such as environmental stewardship payments (6/03/2010). Mick was recently a keynote speaker at a series of GRDC Research Updates, with his opinions on positive ‘megatrends’ for grain and land prices reported in Stock and Land (10/03/2010), Farm Online (10/03/2010), Seedquest News (9/03/2010), ACE Radio (12/03/2010) and in an interview with Meg Strang on ABC Radio (11/03/2010).

Call for papers

The August 2010 edition of the Farm Policy Journal seeks ideas and views on the topic: agricultural inputs – farming with less resources. The deadline for papers is 12 July 2010.
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What do proposed policies say about soil carbon?

In November 2009 the government announced various changes to the proposed CPRS, one being that for an indefinite period, agricultural emissions will remain ‘uncovered’ meaning there would be no direct CPRS costs for farmers. However, farm businesses will still feel the effects of the CPRS through changes in input costs, and as a result of additional costs incurred by processors. Another change announced was that the government will also promote a voluntary market for non-Kyoto compliant emission offsets, including soil carbon.

For farmers, this means that carbon sequestration that is currently not counted as part of the national emission inventory may in future be able to be sold into voluntary carbon markets. Voluntary carbon markets operate where businesses or individuals are not required by law to reduce their emissions, but choose to do so, on a voluntary basis. Carbon sequestration that may be recognised in these markets includes sequestration as a result of actions such as changed management of pastures, enhanced forest management, and revegetation or vegetation management. However, in order to be recognised these activities must occur within Australia, be permanent, measurable, transparent, independently audited and registered, and meet an additional test. The additional test is a requirement that the action be in addition to what is normally required under existing regulations.

The Coalition’s ‘Direct Action’ policy outlines an intention to establish an Emissions Reduction Fund to pay farmers to deliver about 85 million tonnes per annum of CO₂-e abatement by 2020 through soil carbon sequestration. In addition, the Coalition aims to re-establish ‘green corridors’ and urban forests to facilitate the planting of an additional 20 million trees by 2020. The Coalition’s estimation of soil carbon sequestration potential is based upon information from The Garnaut Review,CSIRO, and other groups.

Further, the Coalition policy document states that ‘submissions to the Coalition from farm groups support the potential for a minimum 150 million tonnes of CO₂-e equivalent per annum to be captured in soil carbon by 2020 and beyond, with a payment to farmers of approximately $10 per tonne.’

What sequestration rates are possible on Australian farms?

Soil organic carbon (SOC) is equivalent to the organic fraction of the soil, not including undecayed plant and animal residues. The level of carbon in a soil over time is the result of the rate that carbon dioxide is fixed from the atmosphere by plants, relative to the rate that carbon is removed by livestock grazing or cropping, or as a result of plant breakdown and mineralisation. Soil carbon levels can be increased by either enhancing the rate of carbon dioxide fixation by plants (through the use of fertilisers or changed management) or by slowing down the rate of carbon loss (through reduced cropping or grazing management changes) or by a combination of both these actions. Climatic conditions affect both the rate of carbon fixation, and the rate of carbon loss.

Luo et al. conducted a worldwide review of research on soil carbon change, examining the effect of specific conservation agriculture practices (CAPs). The conclusion, based on data arising from over 20 published studies across Australian agro-ecosystems, was that the introduction of CAPs generally increases soil carbon, but the same CAP can have different effects on soil carbon under different climatic conditions and soil types. There was also no clear trend of increasing soil carbon over the duration of a CAP.

Table 1 (see over) details the results of available research on management practices and their associated impact on SOC sequestration rates, providing some indication of soil sequestration potential under Australian conditions.

While these figures highlight the potential amount of soil carbon sequestration that is theoretically possible on Australian farms each year, it needs to be remembered that most of the above actions are only feasible in the higher rainfall zones. The identified sequestration also requires farmers to adopt these practices. The CSIRO estimates that of the 225 million tonnes CO₂-e that could potentially be sequestered on rural land each year, only 10 to 15% of that is likely to be sequestered; getting landholders to change practices to bring about increased soil carbon sequestration would be the biggest challenge.

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1 Eckard, R 2010, Copenhagen and beyond – What does carbon trading mean for growers?, presentation to the New South Wales GRDC Grains Research Update, University of Melbourne.


5 Kirby, CA 2010, Pools, building blocks and cost – three parts of the soil carbon story, presentation to the New South Wales GRDC Grains Research Update, CSIRO Plant Industry, Charles Sturt University, E H Graham Centre for Agricultural Innovation.


7 See note 3.
FEATURE ARTICLE

How would a soil carbon market work?

In the case of either a voluntary or a mandatory market for soil carbon offsets, the operation of the market would essentially be the same. Existing voluntary soil carbon markets provide an example of how such markets might operate. The Chicago Climate Exchange (CCX) was established in 2003 as the first voluntary trading system for greenhouse credits, including those generated by soil carbon sequestration. Participating members are large corporations, which voluntarily commit to reduce net emissions by a certain amount each year. Members that reduce by more than their targets have surplus credits to sell or bank, while those which produce emissions in excess of their targets are committed to purchasing credits which are generated by qualifying projects, including soil carbon sequestration by farmers.

Carbon prices on the CCX are shown below in Figure 1. In 2007 and 2008, Hamilton et al.8 tracked the volume and value of voluntary and regulatory carbon markets, finding that despite the growth in voluntary markets, the total volume of voluntary carbon markets was 2.9% of the global carbon market, but in value it was only 0.6%. This indicates that the price of carbon offsets in the voluntary market may be expected to be only one-third the price of offsets in mandatory markets.

Under Kyoto Protocol rules, to be recognised as eligible sequestration, an action needs to lock up carbon for an extended period of between 70 and 100 years. If soil carbon sequestration is to be recognised as an eligible offset in mandatory markets, sequestered soil carbon would need to be retained for this period of time. Unfortunately, soil carbon – with the possible exception of biochar – is not stable over such an extended period under Australian conditions.9 Climate and other factors (such as bushfire) can quickly deplete soil carbon, which is why the Australian Government has so far opted not to include it in the national greenhouse emission inventory and as a consequence to not recognise soil carbon offsets in the proposed mandatory CPRS carbon market.

What are the implications for farm business?

To get an idea of how participating in a soil carbon offset market might impact on farm financial performance under either a mandatory or a voluntary offset market, financial modelling was carried under two different carbon prices. The first is that offsets are priced at the Treasury projected carbon prices under the CPRS (a mandatory market price), and the second is that offsets are priced at $100 per tonne CO2-e.

Table 1: Farm management practices and associated soil organic carbon sequestration rates.

<table>
<thead>
<tr>
<th>Category</th>
<th>Management practice</th>
<th>Carbon sequestration (tC/ha/yr)</th>
<th>Carbon dioxide equivalent sequestration (tCO2-e/ha/yr)</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop management</td>
<td>Irrigation</td>
<td>0.05–0.15</td>
<td>0.18–0.55</td>
<td>Lal et al. 2003; Chan et al. 2010</td>
</tr>
<tr>
<td></td>
<td>Fallow elimination</td>
<td>0.10–0.30</td>
<td>0.37–1.1</td>
<td>Lal et al. 2003; Chan et al. 2010</td>
</tr>
<tr>
<td>Conservation tillage</td>
<td>Stubble retention</td>
<td>0–0.4</td>
<td>0–1.47</td>
<td>Lal et al. 2003; Chan et al. 2008, 2010</td>
</tr>
<tr>
<td></td>
<td>Reduced tillage</td>
<td>0–0.4</td>
<td>0–1.47</td>
<td>Lal et al. 2003; Chan et al. 2010</td>
</tr>
<tr>
<td></td>
<td>No-tillage</td>
<td>0–0.4</td>
<td>0–1.47</td>
<td>Lal et al. 2003; Chan et al. 2008, 2010</td>
</tr>
<tr>
<td>Pasture management</td>
<td>Fertiliser management</td>
<td>0.30</td>
<td>1.10</td>
<td>Conant et al. 2001, Chan et al. 2010</td>
</tr>
<tr>
<td></td>
<td>Grazing management</td>
<td>0.35</td>
<td>1.28</td>
<td>Conant et al. 2001, Chan et al. 2010</td>
</tr>
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<td></td>
<td>Irrigation</td>
<td>0.11</td>
<td>0.40</td>
<td>Conant et al. 2001, Chan et al. 2010</td>
</tr>
<tr>
<td></td>
<td>Introduction of legumes</td>
<td>0.75</td>
<td>2.75</td>
<td>Conant et al. 2001, Chan et al. 2010</td>
</tr>
<tr>
<td></td>
<td>Sown pasture</td>
<td>0.50</td>
<td>1.84</td>
<td>Gifford et al. 1992</td>
</tr>
<tr>
<td></td>
<td>Average for improved pasture management</td>
<td>0.55</td>
<td>2.02</td>
<td>Chan et al. 2008</td>
</tr>
</tbody>
</table>

Source: Adapted from Chan et al. (2008, 2010).


9 McKenzie, D 2010, Soil carbon sequestration under pasture in Southern Australia, prepared for Dairy Australia by McKenzie Soil Management Pty Ltd, Orange NSW.
second is where soil carbon offsets are priced at $5/ton CO₂-e (to reflect possible prices in a voluntary carbon market). Financial models were created for a small ($100,000 to $200,000 annual farm turnover) and a large-sized (more than $400,000 annual farm turnover) farm in the high rainfall zone, using financial data derived from ABARE farm surveys. These farms were chosen because of assumptions regarding soil sequestration potential. Rainfall is a limiting factor in the sequestration of soil carbon. For soil carbon sequestration rates to be maintained over a 20 year period, it is assumed that improved pastures would need to be established with a high legume component, and that pasture maintained by the regular application of fertilisers over that period. Such an approach is not feasible in lower rainfall regions.

Using Treasury projections of future carbon, fuel and energy price changes under the CPRS, and assuming a continuation of historical agricultural productivity growth rates, a baseline or business as usual (BAU) projection of future annual farm cash margins was generated, assuming Australia adopts a 15% emission reduction target by 2020.

A number of assumptions were then made in order to generate a projection of future farm cash margins under either a mandatory or a voluntary market for soil carbon offsets. The assumptions made about soil carbon sequestration rates are critical to the results, as are assumptions about the extra costs farmers would face in taking action to sequester soil carbon, and to measure and verify the results. A conceptual measurement, reporting and verification (MRV) system was developed that would appear to be sufficiently robust for a mandatory carbon market. It involved:

- A minimum requirement for twenty soil samples or one sample per four hectares (whichever is greater) to be obtained and tested to establish baseline soil carbon levels, and

- Soil carbon sampling and testing would need to be carried out every five years, and on a whole-farm basis to provide confidence that soil carbon leakage was not occurring between improved and unimproved pasture areas.

To achieve soil carbon sequestration, it was assumed that the farmer would progressively establish legume-based improved pastures, starting with 10% of the grazing area of the farm and sowing an extra 10% every second year until 50% of the farm was under improved pasture. It was assumed that the farmer would need to apply fertiliser to the improved pasture every second year, and that a soil carbon sequestration rate of 2.02 tCO₂-e/ha/yr could be achieved on this area, while soil carbon levels would remain

![Figure 2: Projected farm cash margins for a model high rainfall mixed livestock farm ($100,000–$200,000 revenue) under the CPRS-15 emission price scenario, selling soil carbon offsets at either the prevailing carbon price, or a $5 carbon price (reflecting a voluntary carbon market value). Agricultural emissions remain uncovered in this case.](image1)

![Figure 3: Projected farm cash margins for a model high rainfall mixed livestock farm ($400,000+ revenue) under the CPRS-15 emission price scenario, selling soil carbon offsets at either the prevailing carbon price, or a $5 carbon price (reflecting a voluntary carbon market value). Agricultural emissions remain uncovered in this case.](image2)
unchanged on the rest of the farm. It was also assumed that stocking and cropping rates on the farm would remain constant despite the pasture improvement, in order to ensure the soil carbon sequestration rates could be maintained over the longer term. It was also assumed that only 70% of the estimated amount of carbon sequestration could be sold as an offset, with the rest forming a ‘risk buffer’ for drought years.

Under the mid-range carbon-price scenario (the Treasury CPRS–15 emission price scenario), the initial high pasture establishment and MRV costs result in farm cash margins that are lower and more volatile than the BAU case (without offsets) for approximately the first ten years. Once the maximum area of improved pasture is established (year 10), farm cash margins under the high carbon price scenario (where soil carbon offsets can be sold into a mandatory carbon market) are generally higher than the BAU case, although they fluctuate because of the extra fertiliser costs every second year, and the MRV costs every fifth year. For the larger farm, the overall trend under a mandatory market scenario is essentially the same.

The situation is somewhat different under the assumed soil carbon offset prices that would apply if soil carbon offsets could only be sold into a voluntary market. For both the large and the small farm, the cost of improved pasture establishment, regular fertiliser application and MRV costs are greater than the extra revenue generated from the sale of soil carbon offsets. Under this offset price scenario, the farmer would be better off not participating in the carbon offset market.

It is possible that the MRV framework detailed in this research is more comprehensive than would be required for a voluntary market, and a less rigorous MRV would assist in making soil carbon offsets more viable in a voluntary market. It is also feasible that efficient soil carbon pooling arrangements may reduce MRV costs for either mandatory or voluntary offset markets. As such, the results should not be interpreted as what would happen in an offset system, but rather contribute to the debate regarding future policy development.

**Conclusion**

There are many assumptions that have been made in this modelling, and changes to any of these assumptions could result in significantly different outcomes. However, it is clear that farmers could face significant additional costs as a consequence of deciding to participate in a soil carbon offset market. These extra costs can be prohibitive, especially in the case where the price of soil carbon offsets is relatively modest – such as in a voluntary carbon market.

There are a number of key issues that cannot be adequately incorporated into a simple financial model, and these also need to be considered in thinking about the potential that soil carbon offset markets might hold for farm businesses.

Rates of soil carbon sequestration would be expected to be highest in the early years of adoption of new management practices, and then decline over time as soil carbon equilibrium levels are approached. Once the equilibrium level is reached, it will require a major change in management to again achieve higher carbon sequestration rates. This also means there will be an advantage for those farmers starting with relatively degraded soils, and that farmers who have maintained high soil carbon levels to date will find it difficult to sequester extra carbon in their soil in the future.

Permanence of soil carbon sequestration is another major issue, because of the extent to which soil carbon levels (especially in the short term) are reliant on environmental factors (such as seasonal conditions) over which farmers have no control. When it is considered that the farm business will conceivably face 70 to 100 years of relatively fixed additional costs, but uncertain (and possibly declining) future revenue from soil carbon offsets, the risks associated with participation in such a market become very apparent.

An increase in soil organic carbon in the top layers of soil can induce a decrease in the lower layers of soil. The displacement of carbon from one part of the soil profile to another may not result in an overall increase in the amount of carbon sequestered in soil, and this issue is still poorly understood. In a similar vein, changing management practices to increase soil carbon may well mean that other production opportunities and farm management flexibility is reduced, and this will necessitate careful case-by-case consideration by farm business managers.

As highlighted by this simple financial modelling, the price of carbon heavily influences whether or not it is a profitable additional enterprise for a farm business. Participating in soil carbon offset markets can prove to be uneconomic when the costs of achieving and then demonstrating carbon sequestration are greater than the value of the extra revenue that might be generated. At this stage the risks appear to outweigh the opportunities, meaning soil carbon could well be a lead boot, rather than a lifeline for farm businesses.

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In the ensuing five years since the EU CAP was last reformed, there have been major changes in the international environment in which agricultural trade is conducted. World Trade Organisation (WTO) negotiations have lost momentum and few expect any real progress in the next few years. At the same time, international climate change negotiations and wealthy consumer preferences for ethical and environmentally-friendly products have increased the complexity of trade arrangements. Major international retailers are imposing environmental and ethical standards on their suppliers ahead of government policy, with both the EU and the USA proposing to introduce carbon tariffs which the WTO recognises as complying with existing trade rules.

The Productivity Commission report, ‘Modelling the effects of the EU Common Agricultural Policy’ was released in December 2009. The research used a computable general equilibrium model, the Global Trade Analysis Project (GTAP, version 7), to model the economic impact of the CAP on world agriculture. The main results are not surprising as they outline that different public supports (decreased direct payments, support to export and import tariffs) result in a decrease in some world food commodity prices and in a possible drop in farm sector output outside the EU. The data set unfortunately does not include 2008 and 2009, when particularly high grain prices occurred on world markets without any change in EU CAP policies. There are other limitations to the data used in the study, for instance, the report mentions the CAP budget being 46% of the EU budget (it was 41% in 2009), with a first pillar (market support and direct payments) being 80% of CAP payments (it was 73% in 2009). Leaving aside these limitations, the analysis by the Productivity Commission makes some simplistic assumptions about what would happen if EU agricultural trade restrictions were removed, does not fully consider the meaning and impact of the current CAP reforms, and nor does it address the emergence of environmental and other provenance considerations in international trade.

The GTAP modelling assumptions are that EU farm support payments and trade barriers hinder the ‘efficient’ operation of the market, and that the removal of both would result in expanded opportunities for agricultural exporters such as Australia. GTAP works under the assumption of a transparent international market and doesn’t account for different transaction costs directly impacting on trade relationships (these are costs such as those associated with gaining an understanding of and complying with trade rules, developing local knowledge of markets, and establishing business to business relationships). As such, it does not provide a real indication of the possible outcomes of changes to EU agricultural trade policy for different countries and industries.

The CAP is currently undergoing a serious ‘Health Check’. After undergoing reforms in 1992, 1999 and 2003, the latest Health Check was launched in 2008 and is clearly aimed at reducing CAP spending (limiting CAP expenditure to 33% of the total EU budget). A recent study3 by the Institute of European Environmental Development, IEEP, London, Policy provided a good indication of the main ideas driving the CAP reform process. While the study envisages ongoing support for agriculture, it proposes significant changes in how support is to be provided. The study considers the public goods that are provided by EU farmers, and the fact that their supply cannot be fully secured through markets. These public goods identified include landscapes, farmland biodiversity, water quality and water availability, soil functionality, climate stability, air quality, resilience to flooding, resilience to fire, rural vitality, food security and animal welfare. The report considers how the CAP can be used to enhance these outcomes and further decouple from agricultural production. It is also worth considering that by encouraging EU farmers to identify and enhance the ‘public goods’ associated with their production systems, these policies are also helping to better position EU agricultural products to compete in wealthy markets where provenance is perhaps even more important than price in consumer decisions.

Those who suggest that the EU is just reshuffling the CAP in order to make it (apparently) WTO friendly while supporting an inefficient industry may be right – but they may also miss the fact that the coming competition regime in international agricultural trade will be based on much more than just price and quality. The water or carbon footprint of a product and the sustainability of the system used to produce it may prove to be more important in the future than tariff rates, and there is a danger that in focusing narrowly on the conventional political barriers to trade, the emerging importance of these other factors may be overlooked.
A summary of some Australian and international farm policy developments

FAO author admits livestock emissions importance ‘exaggerated’

After sustained criticism, the author of a 2006 report by the FAO which concluded that livestock emissions were 18% of total global emissions has now admitted the calculations were faulty, and exaggerated the significance of emissions from the livestock sector.

The 2006 FAO report – ‘Livestocks Long Shadow’ concluded that livestock are responsible for 18% of global greenhouse emissions, and therefore a major factor in adding to global atmospheric greenhouse gas concentrations. However, critics of the report (including Professor Frank Mitloehner of the University of California and an analysis by the Australian Farm Institute published in January 2010) highlighted that the report had many flaws, not the least being that it adopted a ‘whole of lifecycle’ approach to livestock emissions, and then compared that figure with only the direct emissions from other sectors to reach the conclusion that livestock emissions were relatively large. The BBC reports that the author has now admitted that the methodology employed was incorrect, and overstates the significance of livestock emissions.

In fact, rather than the 18% reported by the FAO, the IPCC puts direct emissions from livestock at just 4% of total emissions, a relatively minor contribution in comparison with emissions from combustion of fossil fuels. Perhaps somebody should tell Sir Paul McCartney, Al Gore, Jonathan Safran Froer and Sir Nicholas Stern – along with a host of other B to Z grade celebrities who have decided they can save the planet by eating less meat.

Border tax on carbon for the EU?

France is seeking an agreement with the United States on a border carbon tax, convinced that other EU states will come on board if Washington supports the move.

A ‘border tax’ is a tax or customs duty applied to imported goods; and includes taxing imported goods containing greenhouse gases at the same rates that apply to domestic goods, taxing imported goods at a rate which reflects the costs placed on domestic producers, or requiring foreign exporters to purchase emission permits for the carbon content of their goods.

The measure pushed by French Environment Minister Jean-Louis Borloo would allow taxes on imports from countries which haven’t implemented equivalent environmental policies. The European Commission’s official line is that it does not support border tariffs. The clear majority of the 27 EU countries were once opposed to the idea, but it is now contested by just four member states, including Denmark and the Netherlands.

Borloo is seeking support for the measure in the US, where the American Clean Energy and Security Act (ACES) – which has passed through the US House of Representatives – includes a provision for border tax adjustment. The International Reserve Allowance Program is the second strategy in the ACES Act designed to limit carbon leakage and ‘level the playing field’.

Under this provision (Section 768), importers will have to buy emission Allowances for products imported from carbon-uncontrolled nations, equivalent to the cost of Allowances that domestic producers are required to hold. This arrangement is scheduled to commence from 1 January 2020.

Borloo referred to a WTO report often cited by French President Nicolas Sarkozy – who is leading calls for border tariffs – which stated that introducing border tariffs on carbon would not contravene WTO rules, if the tariffs are properly constructed. However the European Commission remains highly skeptical.

A Commission working document on innovative climate financing options, warned that a carbon border tax has ‘a considerable number of drawbacks which would need to be addressed’, including the potential to lead to trade conflicts and retaliatory measures.

Is Tesco engaging in ‘greenwashing’?

In a recent website publication called, ‘What makes a recipe greener?’, the British retailer Tesco advocates to ‘Eat Vegetarian’, arguing that: ‘Vegetables use less energy to produce than meat. So eat vegetarian or vegan meals to reduce your environmental impact and lower your carbon footprint.’

Tesco are the fourth largest retailers worldwide and UK leaders in Carbon Labelling – they were the first partners of the Carbon Trust, in partnership with the British Standards. It is surprising that Tesco would take such a position when their work on meat’s carbon footprint is not finalised and

‘In fact, rather than the 18% reported by the FAO, the IPCC puts direct emissions from livestock at just 4% of total emissions, a relatively minor contribution in comparison with emissions from combustion of fossil fuels.’
when the global understanding of the science and the consequences of such statements are still very contentious. The British National Farmers Union (NFU) immediately responded to these claims, but their voice and argument may not be sufficient to overpower the impact of Tesco’s communication. Such communication may increase levels of “greenwashing” as it is highly likely that sound carbon footprint research and development will not lead to such blunt conclusions.

**McDonald’s UK assessing on-farm methane emissions**

McDonald’s UK have launched a three year ‘on-farm’ methane emissions assessment project. In association with The E-CO₂ project, joint venture of three consultancies (Advance, CMS UK and Kite), McDonald’s UK will follow the greenhouse emission of approximately 350 UK cattle farms. The project will use the only existing official standard, the PAS 2050:2008 (as the ISO 14067 is still under development). As a reminder, all the emissions due to energy use and raw material transformation involved in the production process have to be accounted, but soil carbon storage or other offsets are not accounted.

It is not stated, whether the farmers are McDonald’s usual contractors or how binding are the contracts, but this project will provide both E-CO₂ and McDonald’s UK with a useful database, and the farmers with knowledge and benchmarks on possible mitigation strategies. Such databases would constitute a valuable competitive advantage for their owners, and public or industry research should follow a similar track.

**World’s largest retailer targets greenhouse gas emissions**

Walmart has announced it aims to eliminate 20 million metric tonnes of greenhouse gas emissions from its global supply chain by the end of 2015. This is half the company’s estimated global carbon footprint growth over the next five years. ‘Reducing carbon in the life cycle of our products will often mean reducing energy use. That will mean greater efficiency and, with the rising cost of energy, lower costs, making our business stronger and more competitive’, said Mike Duke, Walmart president and CEO.

There are three components in the program:

1. Walmart will focus on the product categories with the highest embedded carbon, defined as the lifecycle greenhouse gas emissions per unit.

2. For a project to be included in the program, it must reduce greenhouse gas emissions through either sourcing of raw materials, manufacturing, transportation, customer use or end-of-life disposal.

3. ClearCarbon Inc. will perform a quality assurance review of the claims being made in the program.

In 2010 Walmart had sales of US$405 billion, employing more than 2 million people worldwide. When a company of this size places so much emphasis on the carbon footprint of its products, it’s likely to create a wave of action amongst retailers globally.

**More power for European food producers?**

In October 2009, following a year-long inquiry into the food supply chain, a European Commission report concluded that there were ‘significant imbalances’ in contractual relations along the food supply chain. As a result, there was a further investigation into how farmers’ bargaining position could be strengthened.

In the European Union, fruit and vegetable producers are allowed exemption from competition rules, which allows them to jointly fix prices for goods. France, among other EU countries, wants to extend this to other farm sectors. Regarding suppliers and retailers as having too much influence over farm prices, supporters want to give producers more power to negotiate price.

Options floated by the EU executive include changing the competition rules to allow all producers to jointly agree prices, or mandatory use of standard contracts across the supply chain. While France leads the push for new regulation, Britain, Sweden, Denmark and the Czech Republic opposed the move.

**Bayer ordered to pay damages in first of a series of cases**

A jury in St. Louis, United States, has ordered Bayer to pay US$1.5 million in damages to three farmers in the second of four test trials over the alleged mixing of modified rice in the crops of farmers. In the first test case, heard in January 2010, the jury awarded two farmers US$2 million. In August 2006, a rice variety whose genetic code had been modified by a Bayer subsidiary which wasn’t approved for commercial cultivation, was found in the food supply chain. As a result, US rice exports were restricted and prices fell dramatically. About 6000 rice producers and 30 to 40 rice industry businesses filed lawsuits against Bayer, and the theory of the four test cases is that if the jury consistently agree on damages, the parties should agree on a global settlement for all pending cases. The modified variety had a protein which allowed the crop to withstand applications of weed killer.

Meanwhile closer to home, Food Standards Australia New Zealand (FSANZ) has released a consultation document for applications to approve the sale of two genetically modified foods in Australia and New Zealand. All applications require a pre-market safety assessment by FSANZ before they can be approved, and scientific evidence must show they’re safe for human consumption. The applications being considered are for foods derived from insect-protected soybean, drought-tolerant corn and a protein engineered enzyme for use as a processing aid.
Occasional paper released:
The Job Market in Agriculture in Australia

The Australian Farm Institute has begun publishing a series of Occasional Papers on subjects of interest. These papers will be available free of charge to Institute members and subscribers, and to registered visitors to the Institute website. The first of these papers, The Job Market in Agriculture in Australia (Occasional Paper No. 10.01), written by Professor Jim Pratley, Australian Council of Deans of Agriculture and Charles Sturt University, and Mick Hay of Rimfire Resources has been released.

Demand by employers in the agriculture sector has been variously estimated. However there has been no systematic comprehensive analysis of the job market based on actual advertisements. The recently released Occasional Paper addresses that deficiency.

The paper reports that advertisements were monitored over the years 2007 to 2009 inclusive; on the Internet, in national newspapers, metropolitan daily newspapers and state agricultural papers. Some 50,600 advertisements were assessed and categorised into production (on-farm) and a range of occupations in agribusiness. Overlap of Internet and print advertisements was assessed by sub-sampling and figures adjusted accordingly.

Data show that the demand for employees in agriculture has been consistently around 15,000 per year, being in the ratio of 3:2 for production:agribusiness. The print media remains the main vehicle for production jobs (>85%) whereas the Internet is more important for the agribusiness positions (about 45%).

There was a general growth, in the first two years of the study, in the use of the Internet for job advertisements, probably reflecting its lower cost and longer exposure time than is provided by newspaper advertisements. State agricultural newspapers contained around 88% of the newspaper component of the advertisement pool.

Analysis of the data suggests that the job market in agriculture has been substantially underestimated and previous estimates of the demand for graduates have been exceedingly low.

The data overall show that the opportunities for a career on agriculture are strong, both in agribusiness and in production and are substantially in excess of most workforce projections. Such opportunities are greater in Queensland, New South Wales and Victoria probably reflecting the greater diversity of employment and the greater concentration of agribusiness headquarters in these states.

This paper is available for free download to registered users of the Institute’s website and can be accessed at www.farminstitute.org.au/publications/occasional-papers.html. Please note, website users must log-in to access Occasional Papers.
‘If I were the Australian Minister for Agriculture...’

If you were the Australian Minister for Agriculture, what would be your aims for the future of agriculture, and what measures or programs would you implement to make that happen? This was a challenge given to both professional and amateur agricultural policy-makers, with the added incentive of a prize for the two best ‘amateur’ efforts.

The May 2010, Farm Policy Journal will include the winning two papers from AFI’s recent Writers Competition asking entrants to imagine themselves in the Minister’s shoes. The competition judging panel comprises:

- The Hon Tony Burke, Minister for Agriculture and Fisheries
- Secretary Richard Bolt, Victorian Department of Primary Industries
- Dr Linda Botterill, Director of the National Institute for Rural and Regional Australia, Fellow Political Science Program, The Australian National University
- Dr Julianne Schultz AM founding editor of the Griffith REVIEW, and Professor at Griffith’s Centre for Public Culture and Ideas.

The question, ‘What if I were the Australian Minister for Agriculture?’, has also been posited to four authors with expertise in farm policy and knowledge of Australian agriculture.

Professor David Pannell from the School of Agricultural and Resource Economics at the University of Western Australia is Director of the Centre for Environmental Economics and Policy and an ARC Federation Fellow. He has been a prominent commentator on environmental policy within Australia, arguing for policies that better reflect scientific, economic and social realities. He was President of the Australian Agricultural and Resource Economics Society in 2000, a member of the WA Government’s Salinity Taskforce in 2001, and a Director on the Board of Land and Water Australia 2002–05. His research includes the economics of land and water conservation; environmental policy; farmer adoption of land conservation practices; risk management; and economics of farming systems. His research has been published in five books and 150 journal articles and book chapters.

Dr Alistair Watson has been a freelance agricultural economist based in Melbourne since 1989. Previously, Dr Watson was Chief Research Economist for the Australian Bureau of Agricultural and Resource Economics and Senior Lecturer in Agricultural Economics at the University of Melbourne. Dr Watson has a broad range of interests in agricultural and environmental economics concentrating on agricultural marketing and price policy, the economics of research, credit and irrigation (especially in the last ten years. He has undertaken a variety of local and international assignments for government, private firms, farmers’ organisations and international agencies. Dr Watson has been President of the Australian Agricultural and Resource Economics Society and Editor of the Society’s Journal. In 2002, he was elected a Distinguished Fellow of AARES. Dr Watson was Associate Commissioner for two inquiries of the (then) Industries Assistance Commission.

Professor Paul Martin joined UNE as the Director of the Australian Centre for Agriculture and Law in 2005. Professor Martin has many years of business experience, including as a director and substantial shareholder in high technology enterprises, as a director of a successful venture capital firm, and as a member of the NSW Innovation Council and the Australian Government Pooled Development Funds Registration Board. He was also a senior Visiting Fellow at the Australian Graduate School of Management for 20 years, responsible for a range of programs in both law and entrepreneurship. Professor Martin was Chairman of the (NSW) Southern Catchment Management Board. He has authored books and studies on taxation, natural resources, and negotiation; and has advised local and international corporations and governments on strategy in a range of areas including taxation leveraged investment, harvesting and shearing robotics, chemicals, healthcare and high technology.

Professor Margaret Alston, B.Soc. Stud (Syd), Dip. Comp. Applic. (RMIHE), M. Litt (UNE), PhD (UNSW), is the Head of Department in the Department of Social Work at the Faculty Medicine, Nursing and Health Sciences, Monash University. Prior to this she was Professor of Social Work and Human Services and Director of the Centre for Rural Social Research at Charles Sturt University. She is also an Honorary Professor at the University of Sydney. She has served on a number of Boards including the Foundation for Australian Agricultural Women, Family Services Council, Family and Community Services Department in Canberra and the National Women’s Advisory Group overseeing the Rural Women’s Policy Unit in the Department of Primary Industries and Energy. In 2008 she was appointed to the Australian delegation attending the Commission for the Status of Women meeting in New York. In 2009, 2007 and 2003 she has spent time as a visiting expert in the Gender Division of the United Nations Food and Agricultural Organisation in Rome. She has published widely in the field of rural gender and rural social issues.

The May 2010 Farm Policy Journal will be released in early June. It can be viewed, by members and subscribers, or purchased at farminstitute.org.au/publications/farm-policy-journal.html
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