

Are farmers willing to adopt changes?

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WHAT CARBON farming practices are crop and mixed-crop livestock farmers most willing to adopt on their land? Are farmers willing to adopt the practices that are supported by these policy schemes? Those questions were asked in my Honours research project at UWA this year with some interesting results. The survey study examined the factors that are affecting farmers' decisions to change their management practices in the face of increasing atmospheric carbon emissions and climate change.

The project, called 'Using Best Worst Scaling to identify farmers' willingness to adopt carbon farming practices', aimed to determine the willingness of farmers to adopt different carbon farming practices. This was done alongside an analysis of farmers' attitudes and experiences with climate change, and the importance of the potential co-benefits of carbon farming in farmers' decision-making.

The carbon farming practices that most farmers identified as those that they would be 'most likely to adopt' were retaining stubble after crop harvest and adopting no-till cropping practices. These practices, however, have already been widely adopted by WA farmers. Stubble retention and no-till cropping tend to limit the loss of carbon from the soil but are less effective than some of the alternate carbon farming practices which build carbon in the soil, like applying mulch or applying biochar.

No-till cropping practices and retaining stubble, unlike planting trees and establishing areas of native vegetation, require very little to no land to be removed from the cropping rotation and help to improve soil health and reduce erosion. These benefits were identified as the most important co-benefits of carbon farming by the survey respondents.

The practices that farmers are least willing to adopt require the farmer to do a fair bit of work and are likely to be costly. For example, planting trees and establishing areas of native vegetation were not favoured by farmers. The benefit to the farmer of establishing areas of native vegetation and planting trees for harvest relies on a market for carbon (or biodiversity) and a market for selling trees. From the farmers' perspective there was more uncertainty associated with the benefits of planting trees, compared to the benefits of improved soil quality and reduced erosion.

Since the practices that farmers are most willing to adopt have already been adopted, they are not eligible to earn credits under the CFI. It would be most beneficial if the CFI could support farmers in adopting practices such as planting perennial pastures or implementing rotational grazing practices. Under the CFI, a farmer can earn credits for carbon sequestered through applying biochar and establishing areas of native vegetation but so far there has been little to no adoption of these practices as a result. Flexible policy should allow farmers to select the carbon farming practices that are most appropriate for their farm system and their management strategy.



Agriculture is responsible for 15% of Australia's greenhouse gas emissions.

The highest emissions from agriculture are from livestock at 64 per cent. Emissions from agricultural soils are projected to grow 1.9 MtCO₂-e from 2009, reaching 16 MtCO₂-e in 2020. These emissions are linked to the recovery in livestock numbers and to growth in cropping activities. MtCO₂-e: Metric tons of carbon dioxide equivalent, which converts all quantified greenhouse gas into a single, common measurement.

Emissions sources by agricultural sector

| Sector | Mt CO ₂ -e |
|--------------------|-----------------------|
| Agricultural soils | 14 |
| Burning stubbles | 0.3 |
| Rice | 0.2 |
| Livestock | 56 |
| Manure | 3 |
| Savannah burning | 10 |
| Total | 83 |

Note: Total may not add due to rounding.

Source: December 2011 NGGI, ABARES (2012), DCCEE analysis.

carbon keywords

Carbon farming initiative (CFI): The CFI is a voluntary carbon offset scheme that provides financial incentive for farmers and land managers to reduce emissions of greenhouse gasses or to sequester carbon in the landscape. It has been in action in Australia since 2011.

Carbon farming: Farming in a way that reduces emissions or sequesters carbon in vegetation or soils.

Carbon sequestration: The capture and long-term storage of CO₂ in the terrestrial landscape (vegetation or soil).

Soil carbon: Soil carbon is essentially the carbon stored within the soil. There are multiple forms of soil carbon, each contributing to different attributes of the soil. Sequestered carbon is the carbon that is part of the soil for the long term—for example, humus.

Carbon credit/s: A carbon credit is issued for each tonne of CO₂-equivalent. It is issued for each tonne of CO₂-equivalent avoided in terms of emissions or sequestered. Carbon credits issued under the Carbon Farming Initiative are called Australian Carbon Credit Units (ACCUs). These credits can be traded in a voluntary market in Australia. Carbon credits do not have an expiry date so they can be banked for future use or traded immediately upon issue.