CottonInfo **Information** *when you need it*

NSW GOVERNMENT Department of Primary Industries

Emissions Reduction Fund:

Soil carbon sequestration methods (and opportunities to participate)

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Overview:
Two soil carbon methods have been developed for implementing and monitoring offset projects that sequester carbon in agricultural soils. These methods use management actions that increase the input of carbon into the soil and/or reduce the loss of carbon from the soil. These methods are as follows:

Sequestering Soil Carbon in Grazing Systems Method:
This method essentially involves increasing the carbon levels in soils producing pasture for grazing. Soil carbon stocks can be increased by management practices that either increase the amount of biomass (such as plant material) incorporated into the soil and/or reduce losses of soil organic matter that occur through decomposition or erosion.

Within broad parameters, to undertake a project using this method, landholders have a choice of which land management activities to implement to increase soil carbon stocks in grazing systems. Activities must include at least one new management activity.

Model-based Soil Carbon Method:
This method estimates changes in soil carbon on agricultural land using default soil carbon enhancement values that were derived from FullCAM modelling and are provided in the Carbon Farming Initiative (CFI) Mapping Tool.

The method is an alternative to the Sequestering Soil Carbon in Grazing Systems Method, which applies to projects in grazing systems where changes in soil carbon stocks are estimated through direct measurement. Together, the two methods offer participants the option to select the approach that best suits the circumstances of their project.

In terms of the cotton production system, research by Visser, Dargusch et al. (2015) found that soil carbon levels remained steady or declined in all but one industry study. However, Rochester (2011) found that a net increase of 0.37t/ha – 1.1t/ha CO_2e sequestration was achievable. Considerable uncertainty exists around the soil carbon sequestration rates in cotton.

An ERF project requires a minimum bid size of 2,000t CO_2e abatement per annum. Indicative sequestration rates for cotton of 0.5t CO_2e/ha suggests a potential project would require approximately 4,000ha of cotton on an annual basis over the chosen project life. Modelled measurements would need to validate the chosen sequestration rate.

Further information:

- The Sequestering Carbon in Soils in Grazing Systems Method methodology: www.environment.gov.au/climate-change/emissions-reduction-fund/methods/sequestering-carbon-in-soils
- The Model-based Soil Carbon Method methodology: www.cleanenergyregulator.gov.au/ERF/Pages/Choosing%20a%20project%20type/Opportunities%20for%20the%20land%20sector/Vegetation%20and%20sequestration%20methods/Estimating-sequestration-of-carbon-in-soil-using-default-values-model-based-soil-carbon.aspx

References:

Rochester, I. J. (2011). 'Assessing internal crop nitrogen use efficiency in high-yielding irrigated cotton.' Nutrient Cycling in Agroecosystems 90(1): 147-156.

Visser, F., P. Dargusch, C. Smith and P. R. Grace (2015). 'Application of the Crop Carbon Progress Calculator in a 'farm to ship' cotton production case study in Australia.' Journal of Cleaner Production 103: 675-684.

Best Practice