#02 Revegetation to offset greenhouse gas emissions

CARBON SEQUESTRATION

Through the process of photosynthesis, trees remove carbon dioxide (CO_2) from the atmosphere and use the carbon to form the physical structure of the plant (leaves, branches, roots) and returns oxygen to the atmosphere[1]. The process by which carbon is removed from the atmosphere and stored in the plant structure is called carbon sequestration.

Even though all plants contribute to the sequestration of carbon, trees and shrubs have the highest capacity to store carbon. Based on data from typical perennial grasslands and mature forests in Australia, trees are typically 10 times more effective than grasses at storing carbon, per hectare[1].

Through natural processes, revegetation and reforestation offers significant potential to store carbon in vegetation on farms and help counteract greenhouse gas (GHG) emissions from agriculture.

OTHER BENEFITS OF REVEGETATION

- Reduced wind and water erosion
- Alleviation of dryland salinity
- Stock shelter and productivity benefits
- Increase biodiversity and provide habitat for wildlife
- Improved connectivity for wildlife

Our case studies show farmers were able to offset their GHG emissions by revegetating as little as 6-8% of the property.

Holbrook Landcare Network (HLN), as part of the 'Carbon farming and your business' project, carried out on-farm GHG snapshots on eight farming properties across the region. A further four virtual farms, representative to the Holbrook district, were modelled using CSIRO's GrassGro decision support tool. The data from these properties were inputted into the University of Melbourne's Greenhouse Accounting Framework (GAF) calculator.

The case studies showed that it was relatively easy for those producers to offset their GHG emissions by revegetating 6-8% of their property to trees and shrubs.

Not all vegetation stores the same amount of carbon as others (see Table 1). Most revegetation plantings around the Holbrook region are mixed, native species. For the purposes of the case studies we have used a standard figure for carbon sequestered. Different species mixes and densities of plantings may have different values.

TABLE 1. CARBON SEQUESTRATION OF SOME COMMON TREE SPECIES (ha/year)[2]

Tree species	Common name	t CO_2-e/ha in HRZ
Eucalyptus saligna	Sydney blue gum	35.0
Eucalyptus grandis	Rose gum	35.0
Eucalyptus camaldulensis	River red gum	11.7
Eucalyptus sideroxylon	Ironbark	9.3
Acacia melanoxylon	Blackwood	11.7
Casuarina cunninghamiana	She oak	9.3

Please note: this is a guide only, actual tree growth and carbon sequestered depends on local growing areas and the age of the plantations.

EARNING CARBON CREDITS

Producers that offset their on-farm GHG emissions through environmental planting projects could also generate Australian Carbon Credits (ACCUs) by participating in the Australian Government's Emissions Reduction Fund (ERF).

By using a government approved environmental plantings method for carbon sequestration, producers have the potential to earn additional income by selling ACCUs they generate into the ERF. An environmental plantings offsets project will establish permanent plantings of native trees to sequester CO_2 from the atmosphere and store it in the tree biomass and debris. The carbon stored in the forest is calculated using a modelling tool, rather than calculated from field measurements.

Farm Forestry may also be an option for offsetting on-farm GHG emissions and there is also an approved method.

Visit http://www.cleanenergyregulator.gov.au/Emissions-Reduction-Fund for more information on the ERF and approved methods for sequestering carbon.

This factsheet has been developed by Holbrook Landcare Network as part of the 'Carbon Farming and your business' project. This factsheet can be accessed on the Holbrook Landcare Network website www.holbrooklandcare.org.au/carbon.

Factsheets in this series:

#01 - Whole farm greenhouse gas modelling   **#03** - Modelled cattle enterprise

#02 - Revegetation to offset greenhouse gas emissions   **#04** - Modelled sheep enterprise

References

1. Australia's Chief Scientist. (2009). Which plants store more carbon in Australia: forests or grasses? *Australian Government*. Retrieved from http://www.chiefscientist.gov.au/2009/12/which-plants-store-more-carbon-in-australia-forests-or-grasses/

2. Eckard, R., Hegarty, R. and Thomas, G. (2008). Beef Greenhouse Accounting Framework. *University of Melbourne*. Retrieved from http://www.greenhouse.unimelb.edu.au/Tools.htm

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