

Fact sheet

Co-benefit of Trees on Farm: Carbon sequestration

Carbon sequestration rates

Rates of carbon sequestration from tree plantings are variable and depend primarily on tree species and rainfall. Other site characteristics and planting density also influence carbon sequestration rates.

Across 8 Australian studies reported values ranged from 3.79 tonnes of CO₂e/ha over 30 years for mallee in the 300-350 mm rainfall zone in Western Australia²² to 35.1 tonnes of CO₂e/ha in the year of analysis for a planting with 71% shining gum, 23% radiata pine, and the remaining mixed native species on a site with 700 mm rainfall in Tasmania¹⁵. Although timber plantings often sequester more carbon than environmental plantings, mixtures of the two can achieve sequestration rates over 10 t CO₂e/ha/year with adequate rainfall⁹. It is important to highlight that carbon sequestration slows as trees mature. Depending on the site and species, at about 20 to 30 years old, trees sequester little to no carbon²¹. Thus the sequestration benefits decline over time without additional planting.



Planting trees can also lead to changes in soil carbon. Generally, any initial losses following tree planting are recouped within 30 years of planting and these are small compared to gains above ground²⁰. The overall impact depends on previous land use, climate, and the tree species. Soil carbon in Tagasate plantings in an intercropping system with 500 mm rainfall sequestered 3.4 t CO₂e/ha/year in soil over 22 years²⁸.

The extent to which trees offset farm emissions depends largely on carbon sequestration and stocking rates. The farm mentioned above with the high sequestration rate was carbon neutral with trees planted on 10% of the farm in the year of the analysis¹⁵. A modelling investigation of the planting area required to offset emissions found that in areas like Hamilton, Victoria for most operations with stocking rates up to about 20 DSE/ha, 20% of the farm planted to trees would result in carbon neutrality when trees were younger than 30 years old. Beef operations required slightly more area planted to trees than wool or prime lamb. This assumed carbon sequestration rates of 9.1 t CO₂e/ha. In areas similar to Yass, NSW farms of all types with a stocking rate of 6 DSE and 10% of the farm with trees were carbon neutral when the plantings were under 30 years old. All modelled farms with 6 to 10 DSE/ha and with 20% trees stored more carbon than they emitted¹¹.

More information on this topic is available. Find it in the Index of Resources, www.WEBSITE.com

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