Fact Sheet 11

Private Forests Tasmania | Tree Alliance

Farm Emissions and Trees

Trees absorb carbon from the atmosphere and store it as wood.

Climate change is one of the greatest challenges of our time; many farmers are already seeing the impacts.

Balancing carbon emissions is increasingly becoming a requirement of markets and governments. To protect the environment and remain competitive in a carbon neutral economy, landholders should take steps now. Understanding sources and volumes of emissions on your farm is the first step towards preparing for the future.

Tasmania's agriculture sector produces one third of Tasmania's emissions

Without action, climate change is forecast to halve average farm profits by 2050

Around 22 billion tonnes of carbon are stored in Australia's forests

Understanding farm emissions

Greenhouse gasses are absorbed and released throughout the course of everyday activities and across industries – including farming. The amount of greenhouse gas emitted by a farm enterprise depends on the nature of the business and its management processes.

The three main types of greenhouse gas emitted from agricultural processes are:

- **Carbon dioxide** – primarily released through burning fossil fuels, land use change and soil cultivation
- **Nitrous oxide** – primarily released through nitrogen fertiliser use and soil cultivation
- **Methane** – primarily released through stock ruminant digestion

Balancing farm emissions

Identifying the sources and volume of your farm's emissions will help you to design the necessary responses and balance your operations. The basic steps of this process are:

1. Identify your farm's main sources of emissions
2. Measure the volume of emissions and record a baseline
3. Design a strategy to reduce emissions (e.g. tree planting)
4. Undertake strategy activities (e.g., planting and managing trees)
5. Re-measure emissions to evaluate the impact of activities

A range of tools are available to start this process, from simple and basic emissions estimates through to detailed audits conducted by specialists.

Consulting foresters or specialist carbon auditors can assist you to formulate and execute an appropriate emissions-reduction strategy for your farm, and assess the efficacy of activities. They can also discuss options around market opportunities and carbon, whether through carbon credits or through capitalising on growing market demand for net zero products.

Estimate your farm's carbon emissions and find out how many trees are needed to offset them, in less than two minutes, with the Farm Forestry Carbon Tool.

www.carbonestimator.net.au

What is mitigation?

Climate change mitigation is the reduction of greenhouse gasses in the atmosphere. This is achieved by preventing or reducing emissions created at the source (e.g., by using less fossil fuels) and by improving rates of carbon sequestration (e.g., by planting trees).

Trees to reduce emissions

CARBON SEQUESTRATION

Land management activities to balance emissions on farms is known as 'carbon farming', which is a practice that aims to reduce emissions from operational activities, and sequester remaining emissions until emissions are balanced at a very low or carbon neutral level.

Tree planting and forest management are some of the most effective tools to achieve these goals, as they sequester emissions from multiple operational activities while enhancing the environmental resilience of farmland.

Activity	Mitigation measure	
	Emissions reduction	Sequestration improvement
Stock ruminant digestion	Changes to herd and pasture management, biogas capture, and feed supplements and/or feed with lower digestibility	Integrate trees across farmland to increase rates of carbon absorption, including via improvements to soil health
Use of nitrogen fertilisers	Switch to enhanced efficiency fertilisers, optimise the application of fertilisers to minimise nitrogen loss, and increase trees and vegetation to enhance soil health	
Land use change Soil cultivation	Avoid over-grazing and over-clearing, restore degraded land and remnant vegetation, and manage native regrowth forests	
Fossil fuel use	Switch to renewable energy sources (e.g., solar and bioenergy) and increase energy efficiency of technologies	

Table of primary emission sources mapped against mitigation measures. This is not an exhaustive list, emissions-reduction strategies should be formulated under the guidance of a specialist.

As soon as a tree starts to grow, it actively absorbs carbon from the atmosphere and stores it in its trunk, branches, bark, roots and leaves. The amount of carbon sequestered depends on the species, age and size of the tree, as well as its site conditions and climate. Younger trees sequester carbon more rapidly, before slowing later in the tree's lifecycle.

Eucalyptus is considered a high-performing species in the absorption of carbon, thanks to its growth rate properties and sequestration ability. Landholders should balance their objectives and priorities (e.g., commercial opportunities, on-farm benefits, biodiversity preferences) when selecting a species for a plantation.

During the first 20 years of a tree's growth, carbon dioxide sequestered ranges from 4.5 and 40.7 tonnes per year per hectare.

Soil health

Soil represents a major store of the world's carbon, being partly composed of organic matter from trees and vegetation. Agricultural soils have the potential to capture and store significant amounts of carbon, to reduce overall farm emissions.

Healthy soil is far more effective in this process than degraded soil – and trees play a major role in maintaining and promoting soil health. Trees prevent soil erosion from rain and wind, improve soil fertility, and decrease the risk of salinity.

More carbon resides in the world's soil than in the atmosphere and plant life combined.

References

Agriculture Victoria, 2024. Greenhouse gas cycles in agriculture. Victoria State Government. https://agriculture.vic.gov.au/climate-and-weather/understanding-carbon-and-emissions/greenhouse-gas-cycles-in-agriculture

Bernet, R, 2023. How much CO2 does a tree absorb? One Tree Planted. https://onetreeplanted.org/blogs/stories/how-much-co2-does-tree-absorb

Carbon Cycle Institute, 2022. What is Carbon Farming? Carbon Cycle Institute, https://www.carboncycle.org/what-is-carbon-farming/

Commonwealth of Australia, 2023. Agriculture, land and emissions Discussion paper. Australian Government.

Forests Australia, 2018. Forest facts: Carbon in Australia's forests. Australian Government. https://www.agriculture.gov.au/abares/forestsaustralia/forest-facts

Private Forests Tasmania, 2011. Carbon Plantations Kit. Private Forests Tasmania.

Next Step

CALL THE FREE HELPLINE
Ask a question or connect with a forestry consultant.
1300 661 009

VISIT THE KNOWLEDGE HUB
Find info on each stage of growing trees on farms.
www.treealliance.com.au

ARRANGE AN APPOINTMENT
Talk about your goals and find out what's possible.
admin@pft.tas.gov.au

PRIVATE FORESTS TASMANIA
PO Box 180, Kings Meadows Tas 7249
(03) 6777 2720 | admin@pft.tas.gov.au

Tasmania is one of the best places in the world to manage forests for sustainable and profitable outcomes. To learn more about your options for renewable native forest management, contact the team at Private Forests Tasmania on their Tree Alliance hotline or through their general enquiries.

Private Forests Tasmania
Tree Alliance