



CARBON SEQUESTRATION

TECHNICAL INFO ABOUT NATIVE TREES AND CARBON SEQUESTRATION



Trees That Count aims to inspire Kiwis to increase the number of native trees planted in New Zealand. More trees planted will absorb more carbon from the atmosphere, thereby reducing the negative impact of greenhouse gases on our climate and our environment.

CARBON YIELDS FOR NATIVE TREES

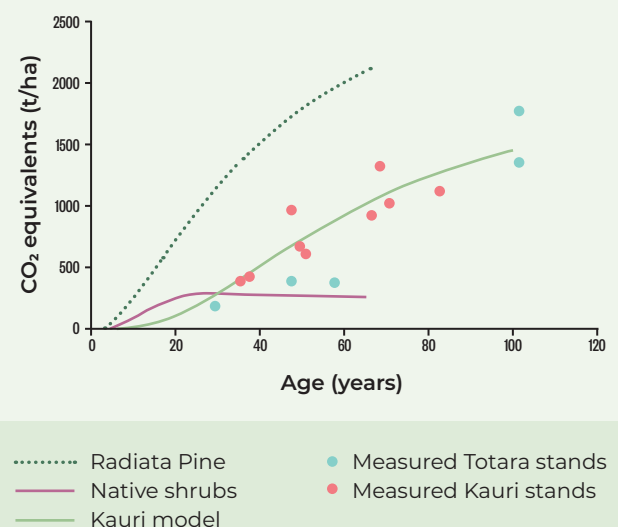
Fifty percent of the biomass (total quantity or weight) of the stems, branches, roots and foliage of trees is made up of carbon absorbed from the atmosphere. Carbon stored in biomass is usually measured in CO₂ equivalents – the weight of CO₂ removed from the atmosphere to create the biomass (e.g. native tree). Carbon yield curves (how much carbon the tree absorbs) are shown in Figure 1. for selected podocarp and hardwood tree species, and for mixed native shrub species commonly planted in restoration and afforestation programmes throughout New Zealand.

While there are differences in growth rates of the major native tree species, all are slow starters compared to the native shrub hardwoods often planted as a nurse cover. The faster initial growth rates and high initial stockings (quantities of native types) often used for plantings of shrub hardwoods can give higher early carbon sequestration rates than inter-planted native tree species. However, most shrub hardwoods typically plateau after 20-30 years, just when growth rates of native tree species begin to increase.

Although fast-growing exotic species such as radiata pine sequester carbon faster than planted natives, all forest irrespective of species eventually plateau with a significant carbon carrying capacity. Unlike most radiata pine stands that are usually felled before 30 years of age (at 800 t/ha CO₂ equivalents),

native forest can be managed as permanent forestry sinks. These native forests can be established as conservation forests or on appropriate sites managed as sustainable production forests using Continuous Cover Forestry (CCF) principles.

FIGURE 1: PREDICTED CARBON SEQUESTRATION RATES ON AVERAGE SITES FOR SEVERAL NATIVE TREE SPECIES, MIXED SPECIES SHRUB PLANTING, AND A TYPICAL RADIATA PINE STAND.



(Modified from: Kimberley, M.; Bergin, D.; Beets, P. 2014: Carbon sequestration by planted native trees and shrubs. Technical Handbook Article No. 10.5. Tane's Tree Trust. 12p).



MORE READING

The Emissions Trading Scheme (ETS) assists New Zealand to meet international climate change obligations. Refer to the Te Uru Rākau website for further details www.mpi.govt.nz/growing-and-harvesting/forestry/forestry-in-the-emissions-trading-scheme/

REQUIREMENTS OF THE ETS

With the aim of making a meaningful response to climate change it's important to make clear what constitutes a tree for this purpose. Trees That Count is following the criteria of the Emissions Trading Scheme (ETS). The ETS assists New Zealand to meet international climate change obligations and puts a price on greenhouse gases which creates incentives to reduce emissions and increase tree planting.

Criteria and definitions required for tree planting (whether native or exotic) to meet the requirements of the ETS include:

- **Forest species** – defined as trees capable of reaching five metres in height in the place they are growing
- **Carbon Accounting Area (CAA)** – a new forest must be at least 1 hectare in size but not necessarily comprising of contiguous forest areas, and planted on non-forested land as at December 1990
- **Forest land** – tree crown cover to comprise of more than 30% on each hectare with an average tree crown cover width of at least 30 metres.

In order to meet these requirements, native trees registered through Trees That Count must be capable of reaching the 5 metre height requirement. Most native trees and shrubs planted in restoration programmes in New Zealand in fact meet this requirement.

Visit treesthatcount.co.nz for more detail on how to determine which species comply.

While Trees That Count focuses on counting the number of trees, it is important that individuals keep a record of the area planted and other relevant information such as stocking and species planted within each registered planting site. This will provide an accurate tally of the area of newly planted native forest to ensure areas qualify as part of the ETS.

Tane's Tree Trust has many publications and best practice guides on the establishment and early management of native forestry. These meet multiple objectives of conservation, carbon sequestration and the option of long term sustainable timber production including Continuous Cover Forestry (e.g. CCF manual by Ian Barton). Refer to the Tane's Tree Trust website www.tanestrees.org.nz

Trees That Count has the potential to create a powerful social movement to plant millions more native trees and reduce New Zealand's carbon emissions.



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