Fact Sheet 08

June. 2025

THE NEW ZEALAND
POPLAR & WILLOW RESEARCH TRUST

Is Cabbage tree a soil Conservation species?

Cabbage tree / ti kouka

Growing 12 to 20 metres high, cabbage trees *(Cordyline australis)* have long narrow leaves that may be up to a metre long. The trees have scented flowers in early summer, which turn into bluish-white berries that birds love to eat.

Mature cabbage trees are a feature of our pastoral landscape often growing in quite challenging situations. Dense plantings can be seen in wetter parts of slopes but on drier slopes trees are generally seen apart from each other.

Cabbage trees are monocotyledons with a root system more akin to grasses than to trees.

As the plant gets old, the stems may die but new shoots grow from any part of the trunk.
The bark and central tissue texture is fibrous, and the central tissue is dense but not woody (Figure 1, Figure 3).



Figure 1. Portions of underground f

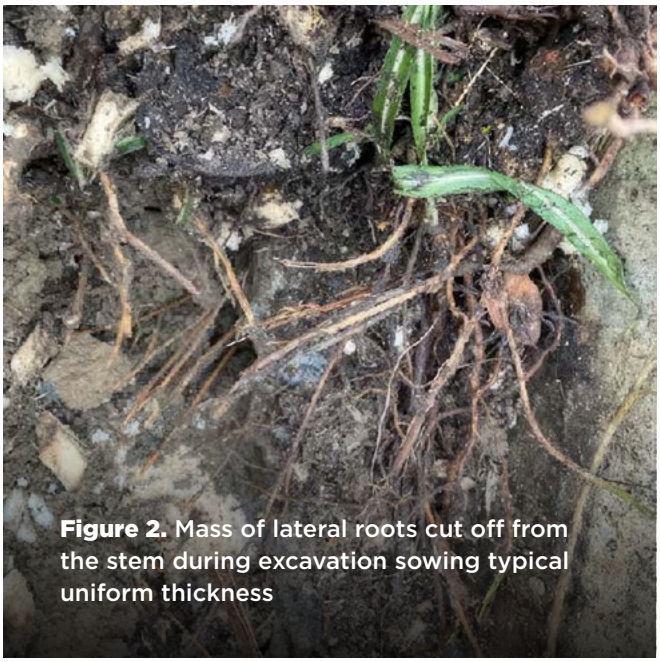


Figure 2. Mass of lateral roots cut off from the stem during excavation sowing typical uniform thickness

Root System

A huge fleshy taproot (a rhizome) anchors the tree firmly into the ground.

Roots emerging from the fleshy tissue of the stem are fat (up to 4-5 mm diameter) and white but as they mature they darken and contract laterally to become spaghetti-like (Czernin & Phillips 2005).

Some branching is seen in new roots (Figure 1) but is not a feature of mature roots (Figure 2).

Mature roots growing from the underground stem are of uniform thickness (rarely exceeding 2-3 mm thick). The soil volume immediately surrounding the stem is densely populated with these thin roots.

However, the roots do not extend far from the stem. Roots of an 8-year-old cabbage tree with a diameter of 8.7 cm excavated from a riverbank near Christchurch had a root spread < 1 m (occupying an area of 3 m2), and roots of a 25-year-old cabbage tree of diameter 59 cm extended only 3 m from the trunk thereby occupying an area of 28-29 m2 (Czernin and Philips 2005).

The taproot (rhizome) tapers and terminates quite abruptly (Figure 3) and while it will continue to extend deeper as the plant ages the roots coming off the end are few. The mass of roots in this excavation were found within 30 cm of the surface.

Are cabbage trees soil conservation species?

Cabbage trees dense root system helps stop soil erosion on steep slopes and because they tolerate wet soil, they are a useful species for planting along stream banks. However, the limited extension of their root system results in very little protection across a pastoral slope (Figure 4). Cabbage trees are resilient and well anchored but unless adjacent trees are planted very close together (spacing of 5-6 m) collectively they will stabilise very little of the slope. The root system of a willow or poplar tree of equivalent age will extend 20 m or more and the same protection can be achieved at spacings of 15-18m.

The slow growth rate and limited root spread of cabbage trees precludes them as an alternative to poplars and willows. However, any established cabbage trees can be incorporated into a soil conservation planting programme.

Reference

Alexander Czernin & Chris Phillips (2005) Below-ground morphology of Cordyline australis (New Zealand cabbage tree) and its suitability for river bank stabilisation, New Zealand Journal of Botany, 43:4, 851-864, DOI: 10.1080/0028825X.2005.9512995

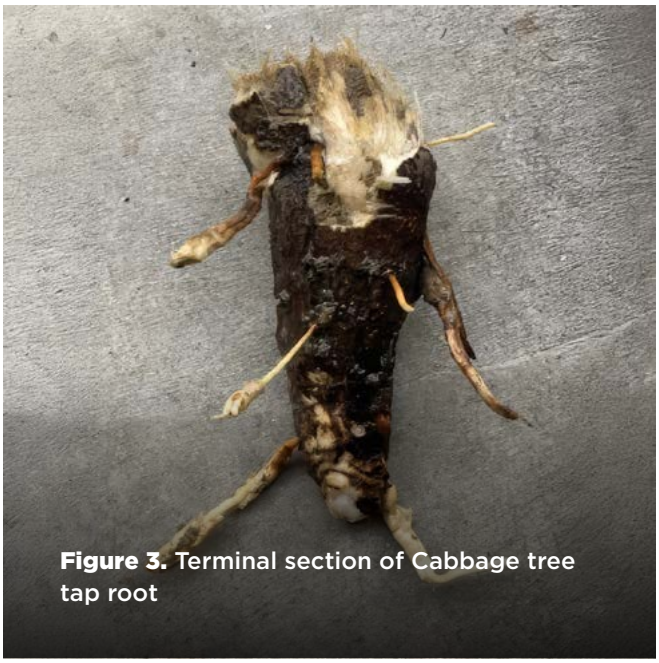


Figure 3. Terminal section of Cabbage tree tap root

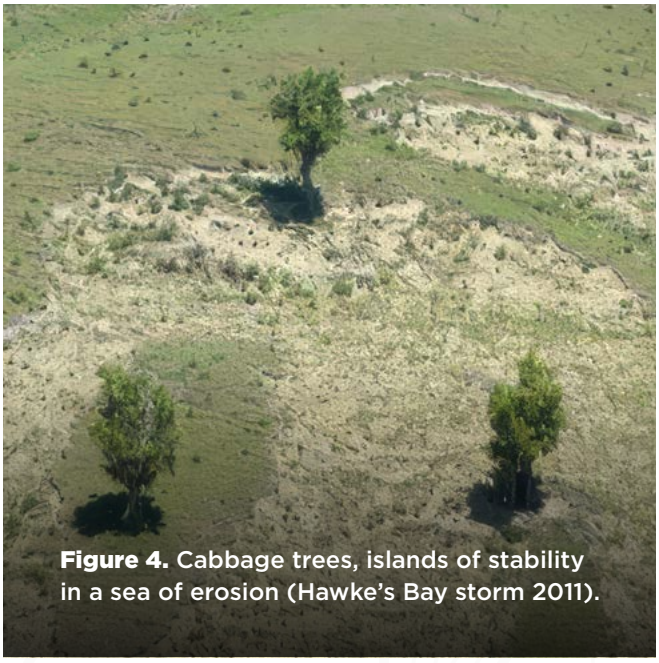


Figure 4. Cabbage trees, islands of stability in a sea of erosion (Hawke's Bay storm 2011).