



## Benefits from using poplars and willows on NZ dairy farms

**Poplars and Willows are extremely versatile trees that can deliver significant cost savings and provide excellent support in achieving environmental outcomes for dairy farmers.**

*A quote from a dairy farmer –*

*“Reducing nutrient loss and reducing water pollution is a key focus for us and judicious planting of willows to get our riparian planting strips off to a great start on our Taranaki dairy farm has played a very important role in achieving our goals.”*

All farmers can empathise with this. Meeting ever more stringent environmental standards and especially around improving water quality is a reality of doing business today and here willows and poplars can be a really powerful tool in:

- Stream stabilisation— these species are easy to plant and establish. They are not easily overcome by weed species such as blackberry, their root system binds exposed soil
- Riparian planting—willows provide a great nursery environment for the establishment of native plants. They shade out aggressive competing species such as grasses and blackberry, providing a shady, high humidity environment for native plants. At the same time they help filter sub surface N and P run-off, shade and cool the water, feed stream organisms from leaves and leaf animals falling in to the stream (~20% of fish diet)
- Dairy shed effluent management—both willows and poplars have been employed in field trials to better manage dairy shed effluent. This may well become an important low cost technology on some dairy farms where surface and subterranean runoff into water bodies is a significant risk. Tree-pasture systems offer potential environmental benefits over straight pasture systems and can supply supplementary fodder (by browsing and/or cut and carry) on smaller land areas.



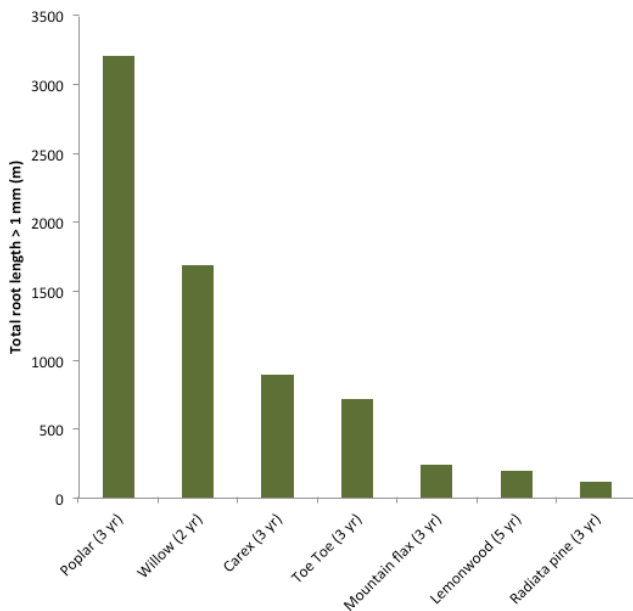
Animal welfare is high on the majority of dairy farmer's priorities. Poplars and willows provide:

- Shelter—poplar and willow shelterbelts are common in Waikato, Taranaki and Southland. They establish quickly, grow fast, are cheap to replace if deaths occur, are easily trimmed and provide ready drought forage. Electric fences protect young trees from stock. In these regions centre pivot irrigators are not common, but where they occur farmers plant around boundaries. Cows in sheltered areas have up to 17% estimated increase in dairy milk production. In Southland poplars are favoured over evergreen species as the latter give too much shade and the ground is slower to dry out
- Shade—cows appreciate shade in the height of summer, and utilise any available shade. Shade provided by trees reduces animal heat stress and reduces feed requirements. Australian research has shown that on a 27°C day unshaded cows have 26% less milk production than shaded cows. Trees can reduce summer heat load in cows by 50%.
- Drought fodder—Willows and poplars provide a highly palatable fodder source for dairy stock in times of summer and autumn feed shortage.

Poplars and willows with some of the most extensive root systems of all trees are used to stabilise soil particularly on slopes and along waterways.

- Slope stabilisation—poplars and willows are planted on runoff blocks and on home dairy farms with hilly terrain and eroding gullies. This is apparent in Manawatu, Bay of Plenty, Taranaki, parts of Taranaki. Willows are planted in gullies because they develop a fibrous root mat that separates soil from eroding water.
- Soil conservation—Increasingly dairy conversions are taking place on hilly land while in some regions dairy cows and heifers are grazed on run offs that are in hill country areas and many young dairy bulls are finished on hill country. Preservation of these land areas from erosion is important both in terms of avoiding loss of valuable soil as well as in maintaining soil quality. The risk is greater when the land is intensively stocked with heavy animals.

The superior ability of poplars and willows to stabilise soils on slopes and gullies as well as around streams compared with native species is due to their much greater root length at the same age (see chart below).



Root length of poplar and willow poles compared with native plants  
Adapted from data provided by Chris Phillips and Mike Marden; Landcare

## DRYING OUT WET AREAS

Many dairy farms are plagued with troublesome wet areas. Willows can be used to dry out these areas and improve pasture quality while being managed for tree fodder.

- willows are efficient because they adapt to wet soil, have a high evapo-transpiration rate when in leaf, their lateral root extension reduces the effects of compaction, and their size is easily managed by coppicing or pollarding.

## GETTING THE RIGHT VARIETY

Regional Councils are in a good position to provide advice on the right variety to plant for particular situations.

Or see [www.poplarandwillow.org.nz/topics](http://www.poplarandwillow.org.nz/topics) willow information and poplar information

## PLANTING

For slope stabilisation and on an open slope, a spacing of 15 metres by 15 metres for mature trees will give protection from earthflows or slips on slopes.

For stream and river protection the trees should be planted two metres back from the stream edge and at initial spacings of five metres. This leaves the edge for herbaceous plants such as Carex grasses (see photo) and provides shading for native woody species.



Ministry for Primary Industries  
Manatū Ahu Matua



Five out of 10 dairy farm regional finalists in the 2013 Ballance Farm Environment Awards used poplars and willows in their farming systems.

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