

RESEARCH BRIEF 10

Willows, poplars and fodder



Poplar and willow provide fodder of sufficient quality and quantity to warrant using them as supplements for feeding to livestock during summer droughts. In addition to the feed quality, the tannins and phenolic glucosides present in the leaves provide pharmaceutical benefits to stock.

Pollarding is a way of managing size of willows and poplars and maintaining a drought fodder source for stock on a rotational basis. Sheep and cattle will readily eat leaves, small stems and bark from the felled branches of willow and poplar. After initial pollarding (removing all the branches above stock browsing height) tree fodder can be harvested every three to four years without threatening the tree's survival. Willows are easier to manage and harvest for fodder than poplars. They produce thinner and more numerous stems, so are easier and safer to harvest.

Pollarded trees have much lower water requirements than non-pollarded trees, and during drought retain a full canopy available as stock fodder.

Fodder is best harvested in late summer after the tree has reached full canopy and when pasture quality is declining.

Edible fodder availability

Tree Status	DBH cm	Edible Dry Matter kg		
		leaf	stem	total
Non-pollarded	36.4	4.60	16.59	21.19
	33.9	5.21	18.80	24.01
	44.9	6.89	24.84	31.73
	38.4	5.56	20.08	25.64
Pollarded	32.9	11.22	8.13	19.36
	38.6	9.91	6.90	16.81
	37.9	10.51	7.32	17.83
	36.5	10.55	7.45	18.00

Table 1. Edible dry matter (DM) calculated for three non-pollarded and three pollarded trees in a dry season (DBH = diameter at breast height).

The non-pollarded trees yielded 47% less leaf, 270% more edible stem, and 142% more edible DM than the pollarded trees. The non-pollarded trees had dropped large numbers of leaves prior to pollarding, in response to the dry soil conditions. The pollarded trees still retained a full canopy of leaf in the drought conditions.

In full leaf the mean edible DM of non-pollarded willows with similar DBH was calculated at 48.6 kg (leaf DM would increase from 5.6 kg to 28.5 kg). This is probably a high estimate since shading reduces leaf DM as noted above. non-pollarded willows once harvested become pollarded willows.

The mean leaf area of the leaves of the pollarded willows was 2.3x higher than that of the non-pollarded willows (i.e. bigger leaves). Pollarding increases the proportion of leaf + branch that is edible.

Fodder yield increases with DBH exponentially. For comparison, a willow with DBH 30 cm will yield -2.5 x the fodder of a willow with DBH of 20 cm. Pollarded trees will continue to grow, so fodder yield will increase with each harvesting cycle.



Feed quality of edible willow and poplar fodder

Nutritive value of willow and poplar fodder is similar to that of summer pasture. The analyses in Table 2 were from fodder harvested from non-pollarded trees in summer in Taihape district. Other assessments of feed quality showed no difference for fodder sourced from pollarded trees. Harvesting in spring is not recommended as the tree is in a vigorous growth phase. Trees pollarded in spring have died as a result.

Cultivar	Crude protein (% DM)	Organic matter digestibility (%DM)	Ash (%DM)	Metabolisable energy (MJ/kgDM)
'Tangoio' willow	36.4	4.60	16.59	21.19
'Veronese' poplar	38.4	5.56	20.08	25.64

Table 2. Nutritive value of edible willow and poplar tree fodder DM (leaf + edible stems ≤ 5 mm diameter)*

*adapted from P Kemp, T Barry and G Douglas 'Using Trees on Farms', p59 Grassland Research and Practice Series No .10

Harvesting stock fodder from pollarded willows in practice

Videos of safe practice for pollarding willows and harvesting fodder from pollarded willows on sloping ground can be viewed at poplarandwillow.org.nz or by clicking or using the short bitly links below in your browser

- > bit.ly/rsb10_old_willows
- > bit.ly/rsb10_young_willows
- > bit.ly/rsb10_willows_within_tree
- > bit.ly/rsb10_tractor_mounted



For more information

This is one in a series of research briefs about Poplars and Willows that can be found at poplarandwillow.org.nz
Prepared by The New Zealand Institute for Plant and Food Research Limited.

Contact

Ian McIvor, Plant & Food Research
ian.mcivor@plantandfood.co.nz

Trevor Jones, Plant & Food Research
trevor.jones@plantandfood.co.nz

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CB0-1108

