



Sustainable Land Management Programme

Introduction

The leaves of most poplars and many willows are very palatable to livestock. Young poles need to be protected from stock until there's sufficient foliage beyond the reach of browsing animals, for the trees to survive. Information Sheet 33 (*Pole planting - establishment*) outlines strategies farmers can use to protect young poles.

Once poles are established, their palatability can be turned to advantage, as supplementary fodder for stock. There are three ways they can be utilised :

- Leaf fall
- Prunings
- Thinnings

Leaf fall

Mature poplars and willows shed a large quantity of leaves in autumn and early winter i.e. April to June. Exact time and duration of leaf-fall depends on which variety is planted. Once trees are established, at about five years of age, leaf fall provides at least 60 kg of dry matter per tree. Table 1 compares the quality of poplar and willow foliage with some other feeds commonly used on farms.



Fig 1 Autumn leaf fall from poplars

DSIR trials show that poplar and willow canopies reduce pasture dm yield (dry matter production) by about 20% if planted at a spacing of 20 metres, and up to 40% if planted every 10 metres. The loss equates to 1600 - 3200 kg dm annually (assuming a typical hill country pasture dm yield of 8000 kg/ha). Leaf fall from the trees, at 1500 kg dm for a 20 metre spacing (25 trees/ha) and 6000 kg dm for a 10 metre spacing (100 stems/ha), usually compensates for the loss, and generally provides additional dry matter production which complements the autumn flush in pasture growth. During summer droughts, early leaf fall may partly compensate for depressed pasture growth.

Other DSIR trials show that where planted on unstable ground, annual dm production from pasture beneath poplar and willow stands is usually greater than from pasture on adjacent unplanted slopes. They indicate that the trees conserve pasture that would otherwise have been lost through erosion of the soil beneath.

Table 1

Feed type	% dry matter	% digestible dry matter	% protein
Poplar and willow leaves	90	56-68	5-17
Pasture silage	30	70	no data
Pasture hay	85	50-53	20-25
Lucerne hay	90	57-65	25
Barley grain	87	82	no data

Sources: Hort Research, Otago Regional Council, Hawkes Bay Regional Council



Fig 2 Stock browsing pruned poplar branches

Prunings

In summer-dry East Coast districts, farmers sometimes lop poplar and willow branches during summer droughts and use them as emergency fodder. This practice cannot be recommended, because the trees have usually been planted for another purpose - soil conservation, shelter or timber production. Too severe a lopping will retard tree growth and misshape their crowns.

However, annual pruning of poplars and willows is recommended from the third year of growth onwards. To avoid infection and disease, the optimum time for pruning is February-March. This fortuitously coincides with the time of year when summer pasture growth is at its minimum, so normal annual pruning can be a good way to supplement the pasture rations if conditions happen to be dry.

Be careful not to take too much off the trees - refer to Information Sheet 34 (pole planting - maintenance) for diagrams and instructions showing correct pruning technique.

Table 2 compares the nutrient content of fresh poplar leaves with typical values for pasture.

Nutrient	% in pasture	% in poplars
Nitrogen	1.46	0.87
Phosphorus	0.12	0.07
Potassium	0.90	0.90
Sulphur	0.10	0.33
Calcium	0.60	3.50
Magnesium	0.18	0.46
Sodium	0.11	0.26
	mg/kg	mg/kg
Iron	530	230
Manganese	212	303
Copper	0.23	15
Zinc	0.37	1.95
Boron	18	1.74
Cobalt	0.40	5.50
Molybdenum	0.40	0.10

Source : Hort Research

Thinnings

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Poplars and willows are generally planted at an initial spacing of 10 to 12 metres on the erodible parts of hillslopes, and 5 to 6 metres on the banks of streams or gullies. By the time trees are 10 years old, they form a near-continuous canopy in summer time, and some thinning may be desirable to maintain summer pasture growth.

At 10 years of age, the stabilising effect of poplar and willow roots extends 5 to 6 metres outwards from the trunk. On highly unstable sites, trees should not be thinned at all. Where this is not the case, it is generally safe to fell every second tree i.e. a final spacing of 20 to 24 metres on slopes, and 10 to 12 metres on streambanks, between years 10 and 15. By 20 years of age, roots from the remaining trees will have expanded into the gaps in between, as roots of the felled trees decay. There is usually some regrowth from stumps (coppicing) and from roots (suckering) of felled trees. It can be controlled by stock browsing the regrowth. If desired, shoots with good growth form can be selected and protected from stock, so that a second generation of trees grows in the gaps of a thinned stand. By the time old trees need to be felled - usually at around 40 to 60 years of age - the second generation will be big enough to take over their protective role.

The branches of thinned trees may be cut and scattered round the paddock, or transported elsewhere on the farm. Either way, a large quantity of stock fodder is available from thinnings. This may be handy if the year of thinning coincides with a drought.

If big old trees are felled in summer or autumn, their foliage-bearing upper branches likewise provide a supply of stock fodder.

Where to get advice

The Taranaki Regional Council offers a free advisory service to landowners who are interested in using their poplars and willows for stock fodder. It is a good idea to talk this through with one of the Council's Land Management Officers, to ensure that feeding foliage to stock doesn't compromise the trees' value for soil conservation, farm shelter or timber production.

For further advice or information about poplars and willows, contact:

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