

# Poplars for timber production

Sustainable Land Management Programme

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## Introduction

Poplars are widely used in overseas countries as a source of timber for furniture manufacture, match-making and pulp. They are not currently used for these purposes in New Zealand, where the species is generally planted for soil conservation, farm shelter or amenity. Amongst landowners who have established poplar plantings on farms, there is growing interest in the possibility of harvesting timber. This information sheet outlines what's required if a stand is to be managed with timber production in mind.

## Poplar varieties

The Council's information sheet LM35 lists varieties currently viewed as suitable for growing in Taranaki. Amongst these, Kawa and Yeogi have the best properties for timber production. Other varieties such as Toa and Tasman also have good timber potential.

## Planting

Once a suitable variety has been identified for the planting site, planting is best done between June and August. Poplars are generally planted as poles, stakes or cuttings. Refer to information sheets LM33 and LM34 for advice about pre-planting storage, planting technique, and post-planting maintenance.

Establishment costs are currently :

- \$1 to \$3.50 per plant (depends on size)
- \$2 to \$3.50 per tree protector (depends on type)
- \$1.50 to \$2.50 per tree for contract planting labour (if used).

## Stand density

Optimum stand density varies according to whether timber production or pastoral production is given priority :

**Soil conservation** - where pastoral production is given priority, final spacings of 100 (10 m x 10m) to 25 (20 m x 20m) stems per hectare will supply low-volume timber yields

**Agroforestry** - where pastoral production and timber production are equally important, final spacings of 150 (8m x 8.5m) to 100 (10m x 10m) stems per hectare yield moderate volumes of timber



*A poplar woodlot. Trees have been pruned and thinned to ensure good timber.*

**Woodlots** - where timber production is given priority, final spacings of 300 (6m x 5.5m) to 200 (7m x 7m) stems per hectare ensure high timber yields.

For all three types of planting, initial spacings should be 15 to 25% closer than final, particularly on marginal sites. This allows for tree mortality, and also gives scope for tree selection by thinning in subsequent years.

## Grazing

Young poplars either have to be protected from stock damage by fitting sleeves or temporarily excluding stock, until sufficient foliage is beyond the animals' reach for trees to survive and enough rough bark develops to

deter browsing and rubbing.

The use of tree protectors imposes additional costs and would only be considered where grazing is a priority. In soil conservation stands, tree protectors are generally used so that stock can be grazed shortly after planting. In agroforestry stands their use could be considered, but retirement from grazing for 1 to 2 years is a better option. In woodlots protectors are not needed, provided the woodlot is fenced. If the woodlot understorey is to be grazed, stock can be re-introduced around years 3 to 4, provided the poles have grown fast and rough bark has formed meanwhile.

If continuous grazing is not carried out, for instance in woodlots or in agroforestry stands which are temporarily retired while trees establish, pre- and post-plant spraying of competing vegetation is essential. Where young trees are left untended in rank grass, collar rot can occur causing death in severe cases.

*Refer to Information Sheet LM37 for additional advice about grazing livestock in poplar stands.*

## Silviculture

Pruning is essential to produce clean, knot-free timber and quality butt logs for sawn timber or veneer products. Pruning should ideally be carried out in February and March. This reduces epicormic regrowth and the incidence of disease or pest attack. Poplars usually require form pruning to ensure a single leader

develops into a straight log in the first few years. Prune individual trees every two years to a minimum height of 6 metres for log production, leaving 50% of the tree's height as green crown after each prune. See Information Sheet LM34 for diagrams which demonstrate correct pruning technique.

Poplar woodlots are generally planted at or close to the final stand densities recommended above. Occasionally they are planted at closer densities eg. 5m by 5m spacings, on erosion-prone hillslopes or riverbanks. Here, thinning must be post-poned until root density is sufficient to stabilise ground between the remaining trees. Some good rules-of-thumb for thinning are :

- In soil conservation stands, thin to 25-50 s.p.h. (stems per hectare) between years 15 and 20
- In agroforestry stands, thin to 100-150 s.p.h. between years 10 and 15
- In woodlots, thin to 200-300 s.p.h. between years 5 and 10.

### Pests and Diseases

Possoms can cause considerable damage to poplars through browsing and breakage. Varieties with low palatability should be planted where possums are likely, and control programmes should also be implemented i.e. poisoning, shooting or trapping. See Information Sheet LM35 for advice about possum-resistant clones.

Leaf rust (*Melampsora* spp.) and leaf spot (*Marssonina* spp.) attacks can cause serious foliage damage, but are largely dependent on warm, moist weather. Rust-resistant varieties of poplar are now available.

Boring beetles such as lemon tree borer can be avoided by pruning at the right time (February to March). Some fungal diseases such as silver leaf can be avoided through correct timing of silviculture to coincide with dry weather. Other bacterial fungi like black heart cannot be avoided, and the resulting rot may cause problems when drying poplar timber or treating it with preservative.

### Yields

Typically, yields will vary with each poplar variety, site, and stocking rate. Research estimates, and a few recorded harvests in the North Island, suggest a crop at a stocking of 200 s.p.h. will yield around 400 to 450 cubic metres per hectare over a 20 year rotation, with 15-20 metres of trunk per tree over 0.2 metres s.e.d. (short end diameter). A crop at a stocking of 100 s.p.h. will yield 200 to 250 cubic metres.

Poplars are generally planted in small stands, often on steep land that's difficult to access. This can make conventional harvest by skidder or hauler, followed by trucking to a sawmill, an expensive proposition. On-site processing, by a portable sawmill, is usually feasible and may cost a good deal less.

### Uses

Poplar timber is a light coloured, low density hardwood with a fine texture and complete lack of resin or taint. The timber is durable, moderately strong, and resistant to splitting. Sawn timber can be used for a variety of purposes: joinery, pulp, paper, furniture, structural work, flooring, boxes, crates, wooden utensils, veneer, plywood and farm timber. Its ability to work, stain, polish, varnish and glue make poplar an easy timber for manufacturers to use.

However, poplars are subject to tension wood because of New Zealand's windy climate creating stress on the trees. This can make the timber difficult to saw. Wet core wood leads to drying difficulties such as distortion, and other complications such as fungal stain. Careful clone and site selection can reduce severity of these problems. Poplar being a hardwood does not need to be treated for indoor use, but pressure treatment with preservatives is still necessary if the timber is to be used for external construction or ground contact.

### Markets

The well known qualities of poplar timber ought to offer good opportunities for market development. However, until now there has been no domestic market. A few furniture manufacturers take poplar, but do not need large quantities. Pulp and fibreboard mills report good product quality from processing trial batches, but are not prepared to convert from pine to poplar in the absence of a guaranteed large-volume supply.

There has been little exposure of New Zealand poplar to world markets. Trial shipments were sent to Japan, Korea and Taiwan in the mid-1990s, where prices paid were similar to those for equivalent grades of radiata pine. Subsequent orders have not been forthcoming, partly because New Zealand exporters have not been able to organise harvest of existing stands for regular shipment. The low cost of pine, together with its availability in large volumes from New Zealand and other exporters, is also a deterrent to developing an export trade in poplar timber or pulp.

Poplar timber has the potential to provide a good return to landowners in future years, as harvesting and marketing operations improve.



*Furniture made from poplar timber*