



GROWING CYPRESSES FOR TIMBER

Thinning cypresses

Information Note **4**

The right cypress species grown on the right site and well-managed throughout the rotation will produce high-quality timber with many potential end uses.

There is no one 'right' way to grow cypresses; this applies just as much to thinning as to other operations. This Information Note introduces some of the general principles of thinning, and will help you understand how your target final crop stocking and rotation length should guide thinning operations.

Knowing your target rotation length at the outset is important, as this will guide thinning intensity.

WHY THIN?

If growing trees for timber, normal practice is to plant many more trees than the number eventually planned for harvest. High early stocking density encourages trees to grow straight and tall, and restricts the size of branches.

If left at its initial planting density, a plantation will grow many thin trees. Most cypress growers aim to produce clearwood (knot-free wood) from pruned trees. Clearwood is generally the most valuable timber. To maximise the volume of clearwood produced in a rotation, trees need to have put on diameter and volume (grown fat), and timely thinning is required for this.

Timely thinning means a plantation:

- maintains its growth rate because trees are not competing with their neighbours for light
- produces larger, fatter individual trees and, if pruned, a higher volume of clearwood
- remains relatively stable in high winds.

WHEN TO THIN CYPRESSES

The trigger for thinning is to look at the tree crowns and the lower branches.

Once the canopy closes over and crowns begin to compete for light, thinning is due. Lower branches will also begin to die from lack of light when the canopy closes; cypresses are more shade tolerant than radiata pine which means lower branches persist longer. Dead lower branches are a good indicator that thinning is (over)due. Most cypress growers start thinning once pruning is complete; on productive sites the first thin is likely at around age 8-10 years, and the second thin 2-3 years later.



Above: An 18-year old *C macrocarpa* stand, ready for its second thin. Below: A 17-year old *C lusitanica*, thinned to its final stocking of around 370 stems per hectare.

Cypresses are a relatively shade-tolerant species and can cope with some crown competition without suffering a major decline in growth rates or crown malformation. However, leaving thinning too late increases the risk of toppling in remaining crop trees.

Thinning intensity should depend on your target rotation length. Common cypress regimes generally aim to produce final crops of 200-400 stems per hectare over 30-35 years.

If a stand is over-thinned, the risk is that big branches will develop in the unpruned 'top logs' which will be down-graded by sawmillers. With cypresses, two or three thinning operations generally result in a plantation that maintains good overall growth while branch size is controlled.



This 18-year old *C. macrocarpa* log clearly shows pruning stubs and the clearwood that has formed following pruning – (i) lighter sapwood, and (ii) darker, more durable heartwood. The older the tree, the higher the heartwood to sapwood ratio.

The sooner you want to harvest your trees, the higher the final stocking rate should be and the fewer trees you need to remove by thinning. Shorter rotations mean a lower total volume of timber harvested per hectare, but a quicker return on investment.

It is also important to consider (i) DOS and the (ii) heartwood to sapwood ratio.

- (i) If the DOS is high, such as from a two-lift prune, the trees should be thinned more and grown for longer, to maximise the volume of clearwood grown outside the knotty core.
- (ii) Sapwood is the young, living outer rings of wood laid down by the tree. Sapwood dies to become heartwood, which is more durable and more highly valued by sawmillers. The older the tree, the higher the heartwood to sapwood ratio. If the target timber output is clear heartwood, again a lower final stocking and longer rotation length is recommended.

How rotation length, final stocking, individual tree size and total volume of timber grown interact – some indicative data for *C. lusitanica*

| Rotation length (years) | Final stocking rate (stems per hectare) | Individual tree diameter at harvest (DBH* cm) | Total standing volume per hectare (m ³) at harvest |
|-------------------------|---|---|--|
| 25 | 380 | 45 | 480 |
| 35 | 250 | 60 | 685 |
| 44 | 135 | 80+ | 750 |

Trees grown on an average site, planted at 1100 sph and thinned twice by age 12 (plus one production thin at age 25 for the 45-year rotation crop). (Source: FFR Cypress Calculator, available at www.nzffa.org.nz)

* DBH = diameter at breast height, 1.4m

HOW TO THIN CYPRESSES

Thinning provides the opportunity to select the best stems in a crop, cull any diseased stems or those with poor form, and then remove additional trees until the target stocking for that thinning operation is reached. Farm foresters are renowned for under-thinning their plantations. It helps to understand the relationship between target diameters, stocking and rotation length.

Novice growers are advised to mark a sample area of trees to be thinned with dazzle paint, bearing in mind the target spacing of the trees left standing. Thin this area, then assess the area again (e.g. by measuring the approximate distance between trees left standing). This will help you 'get your eye in' for thinning to your target stocking rate.

Thinning requires skill, both in selecting trees to thin out, and in felling the trees: Use an experienced contractor if in doubt.

Example target stockings and spacings for cypresses over a rotation:

| Spacing between trees (metres) | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 7.0 | 8.0 |
|--------------------------------|------|------|------|------|-----|-----|-----|
| 2.0 | 2500 | 1666 | 1250 | 1000 | 833 | | |
| 3.0 | 1666 | 1111 | 833 | 666 | 555 | | |
| 4.0 | 1250 | 833 | 625 | 500 | 416 | | |
| 5.0 | 1000 | 666 | 500 | 400 | 400 | | |
| 6.0 | 833 | 555 | 416 | 333 | 277 | | |
| 7.0 | | | | | 238 | 204 | |
| 8.0 | | | | | | 178 | 156 |

- Planting
- First thin
- Second and further thins

Photos: John Milne.



8-year old Ovens cypress, before and after its first thin, taking stocking from around 1100 stems per hectare to around 600 sph.

PRODUCTION THINNING

Production thinning entails extracting and utilising trees which have been felled in a thinning operation from a mid-aged stand.

Cypress timber from young trees is stable and can be sawn and utilised, so production thinning is an option. Logs ideally need to have a minimum 'small end diameter' (SED) of 15-20cm to be worth sawing. Access into and within the plantation needs to be good.

Production thinning can be done as a 'one-off' thinning operation, or alternatively trees can be progressively removed from a mid-aged stand; this second approach is attractive if the plan is to grow the final crop trees on a relatively long rotation. Production thinning requires skilled operators if damage to standing trees is to be minimised.

MORE INFORMATION

The best source of information and expertise about growing cypresses is the NZFFA Cypress Development Group. We recommend you join this group.

This information note is one of a series produced by the NZ Farm Forestry Association with funding from the MPI Sustainable Farming Fund. A series of videos is also available.

www.nzffa.org.nz

