

**THE EFFECT OF PHYSIOLOGICAL AGE OF
CUTTINGS ON UNPRUNED LOG QUALITY
— ESTABLISHMENT REPORT**

G. Holden, B. Klomp & J. Tombleson

Report No. 5

November 1994

FOREST & FARM PLANTATION MANAGEMENT COOPERATIVE

EXECUTIVE SUMMARY

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A trial to compare the growth and quality of radiata pine cuttings and seedlings was established in July 1994 on a fertile farm site located near Te Puke. Cuttings from 3- and 6-yr-old trees will be compared with seedlings of the same seedlot established at initial stockings of 400 and 600 stems per hectare.

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BACKGROUND

Analysis of an extensive series of trials established in 1983/84 comparing radiata pine seedlings and cuttings has shown that on fertile farm sites 'aged' cuttings with a physiological age of 3 years or greater are less prone to topple, have straighter butt logs with higher predicted grade outturn and value (Coop. Report No. 34). However cuttings which are physiologically aged 4 years or greater often suffer a diameter loss (Coop. Report No. 29).

While there is clearly improvement in the pruned log quality of aged cuttings it is apparent that on fertile sites the quality of the unpruned logs may be similar for seedlings and cuttings due mainly to the large branches which occur at lower stockings (<300 sph), although the seedlings often have a higher incidence of broken tops. The 1983/84 trial series is too young to quantify differences in unpruned log quality.

There may however be advantages in using physiologically aged cuttings (up to 6 years) on fertile sites, despite the loss in diameter growth, in an attempt to improve the quality of the unpruned logs.

Earlier trials using older aged cuttings are generally of a row plot design and/or on lower fertility sites and are not considered satisfactory for evaluating the unpruned log characteristics.

OBJECTIVE

To establish a trial on an ex-farm site to compare the tree growth and quality of older physiologically-aged cuttings with seedlings. The trade-off between (smaller) stem diameter and branch size of the older physiologically-aged cuttings will also be examined.

METHOD

Cutting material was collected in June 1993 from a trial (established in 1987) and a routine planting (established in 1991) in Kaingaroa Forest. This material was physiologically 6-year-old and 3-year-old respectively at the time of collection and was set in the NZFRI nursery along with seed from the same seedlot as the 6-year-old cuttings originated.

STOCK TYPES

Seedlings — 1/0 Control pollinated, Seedlot No. 6/3/86/054, GF21

Cuttings — Cuttings from 3-year-old trees, GF22

Cuttings — Cuttings from 6-year-old trees, Seedlot No. 6/3/86/054, GF21

TRIAL DESIGN

The trial was established as a randomised block design containing 5 replications per tree stock type and at initial stockings of 400 stems/ha and 600 stems/ha. Each plot measures 50m x 50m including a 2 row buffer(using the same seedlot, except for plots 19 & 24 which had GF 17 buffers due to a shortage of GF 21 seedlings) around each inner plot. Plant espacement is 5m x 5m (400sph) and 4.1m x 4.1m (600sph). Due to insufficient cuttings from the 6-year-old trees being available, this type was established at 600 sph only. The total of 25 plots occupy an area of 6.25 hectares.

SITE

The trial is located on a fertile ex-farm site, the property of Clearwood Forest Partnership, Mystery Valley, Bay of Plenty.

The soil is derived from Kaharoa ash and is described as yellow brown pumice on yellow brown loam.

The altitude is 180m asl and the annual rainfall 1200 - 1300 mm.

The site is flat to moderately undulating.

The trees were planted by NZFRI staff and contractors on 8 & 9/7/94 using spades, and were released by contractors with Gardoprim/Galant the following week.

A total of 3100 trees were planted at an average stocking of 500 sph.

FUTURE MANAGEMENT

Numbered round posts marking plot corners should be put in within 12 months and the need for further releasing will be assessed at this time.

All trees will be variable lift pruned (to a target DOS of 19 cm) to a height of 6.5 metres. Plots will be thinned to their final crop stocking at the time of final pruning.

MEASUREMENTS

Following planting, all trees in the inner plots were measured for height. Growth, survival and incidence of toppling will be recorded annually until first lift pruning.

At the time of first pruning lift (approx. 4 years) trees in the inner plots will be tagged and measured for height, dbh and pruning details. Data will be entered on the NZFRI Permanent Sample Plot system. Pruning and growth measurements will be collected at the time of each pruning lift. Following final lift pruning the butt log will be measured for sweep using a straight edge. Thereafter a sample of tree heights and dbh will be collected every second year.

At the time of canopy closure measurements of branch characteristics of the unpruned logs will be obtained and these may continue as the green crown rises.

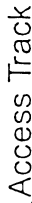
Later in the rotation measurements of stem taper, butt log sweep and wood properties may be obtained, however this work would be the subject of a new work plan.

REFERENCES

Klomp, B.K.; Holden, D.G.; Hong, S.O.; Menzies, M.I. (1992). Growth and survival of Radiata pine cuttings, plantlets, and seedlings on ten North Island sites. Stand Management Cooperative Report No. 29

Holden, D.G.; Klomp, B.K.; Hong, S.O. (1993). Pruned butt-log quality of Radiata pine cuttings, plantlets, and seedlings on eight North Island sites. Stand Management Cooperative Report No. 34

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Block 1 Plots 1-5
Block 2 Plots 6-10
Block 3 Plots 11-15
Block 4 Plots 16-20
Block 5 Plots 21-25

1 Seedling 400 sph
2 Seedling 600 sph
3 Cutting 3yr 400 sph
4 Cutting 3yr 600 sph
5 Cutting 6yr 600 sph

 Cutting Quality Trial
Total area 0.31 ha

