

**TRIALS DESIGNED TO QUANTIFY GROWTH AND YIELD GAINS
FROM GENETICALLY IMPROVED RADIATA PINE
-- FOURTH REVISION --**

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**N.B. The addendum replaces all Tables and Appendices in Stand Growth Modelling
Cooperative Reports No. 24, No. 24a, No. 40 and No. 70**

***Forest Research* /INDUSTRY RESEARCH COOPERATIVES**

EXECUTIVE SUMMARY

Stand Growth Modelling Cooperative Report No. 24 outlined the permanent sample plots in genetic trials being supported by the Cooperative in 1991. Details of trial design, including experimental design, silviculture and seedlots were presented in a series of Tables and Appendices. Report No. 24a (March 1994) and No. 40 (June 1995) documented modifications and corrections which were made between 1991 and 1995. Stand Growth Modelling Cooperative Report No. 70 outlined the permanent sample plots in Genetic Gain and Silviculture/Breed trials being supported by the Cooperative in 1998.

This report outlines the permanent sample plots in Genetic Gain, Silviculture/Breed and Special-purpose Breed trials being supported by the Cooperative in 2001. In 1999 the Stand Growth Modelling Cooperative and Radiata Pine Breeding Company agreed to collaborate (on a 50:50 basis) to fund the establishment and long-term remeasurements of the Special-purpose Breed trials planted in 1992 and 1994. New documentation showing experimental design for these trials is included in this report.

All trials have now been established with PSPs; current plans for these trials, establishment information and modifications in trial designs since previous reports are included. This document presents a comprehensive summary of the status of all trials and permanent sample plots supported by the Stand Growth Modelling Cooperative (and in collaboration with the Radiata Pine Breeding Company) as at July 2001.

The number and timing of measurements carried out under the umbrella of this Cooperative has been revised to reduce time spent on plot measurements. The proposed Work Programme 2000 – 2004 reflects the current remeasurement schedule agreed to in 1999.

The addendum replaces all Tables and Appendices in Stand Growth Modelling Cooperative Report No. 24, its 1st revision (Report No. 24a), its 2nd revision (Report No. 40) and the 3rd revision (Report No. 70).

1. INTRODUCTION

Measurement and establishment of permanent sample plots (PSP's) has progressed on schedule since issue of Report No. 70. Documentation of the current status for each trial/plot is presented in Appendices 1-33 (updated versions of Appendices in Report No. 70). In addition, summary tables from Report 70 are included in this report with appropriate updates.

In 1999 the Stand Growth Modelling Cooperative and Radiata Pine Breeding Company agreed to collaborate (on a 50:50 basis) to fund the establishment and long-term remeasurements of the Special-purpose Breed trials planted in 1992 and 1994. New documentation showing experimental design for these trials is included in this report (Appendices 34-39). Tables 4a and 4b document location and PSP details of these new trials.

Overall, this report presents a comprehensive summary of the status of all trials and permanent sample plots supported (both fully and jointly) by the Stand Growth Modelling Cooperative as of June 2001.

2. OVERVIEW OF COOPERATIVE TRIALS

PSPs in genetic gain trials represent a wide range of regions and sites, as well as comparisons among seedlots and silvicultural treatments.

The trial design of this series falls into three categories:

- Plots superimposed on existing trials (Tables 4a, 4b & 4c).
- Plots designed with a wide range of spacing treatments, planted specifically for provision of genetic gain data for growth models; Silviculture/Breed trials (Tables 5a & 5b).
- Plots designed to test the performance of special purpose Radiata pine breeds; Special-purpose Breed trials (Tables 6a & 6b).

The Silviculture/Breed and Special-purpose Breed trials have been planted to represent a matrix of site qualities, regions, breeds and treatments (Table 7).

A summary of the site categories and GF ratings of seedlots represented in all of the trials is presented in Table 8. The silviculture, planting stock and measurement information is updated for each trial in Appendices 1-39.

The projected remeasurement schedule for 2000-2004 is documented in Table 9.

3. MODIFICATIONS IN COOPERATIVE TRIALS

Changes in Silvicultural Treatments

Two additional treatments have been added to Silviculture/Breed trials FR77 and FR78. These trials originally had three replications of each treatment (pruned and thinned to 400 and 200 stems/ha). Two additional silvicultural treatments were added with one replication of each. The number of replications of the original treatments was reduced from three to two. The additional treatments are:

- 1) unpruned and unthinned, and
- 2) pruned with a late thinning to 200 stems/ha at 20m MCH (Appendices 20 and 21).

The original experimental design of the 1992 Special-purpose Breeds trials included seven treatments, 3 pruned and 4 unpruned at various initial and final stockings, with no replication within site (Table 1). In July 1999 a joint sub-committee of the SGMC and RPBC agreed upon a new trial design where by there was a consolidation of treatments to provide better on-site replication. The treatment planted at 250sph was abandoned and no PSPs will be established as this regime had proved to be unsatisfactory (much top damage due to the open spacing) in the Silviculture/Breed trial series. An unthinned / unpruned treatment will be allocated to the 500sph planted plots to reflect current practices (particularly of Carter Holt Harvey Forests) and the remaining plots planted at 1000sph will all be pruned for access only and thinned to 400sph (Table 2).

TABLE 1. Original core experimental design for the 1992 Special-purpose Breeds trials.

Trt	Pruning	Thinning at age 8			
		Initial Planting	Final Crop Stocking	Initial Spacing	Plot area (ha)
1	✓	250	100	5 x 8	0.100
2	✓	500	200	5 x 4	0.050
3	✓	1000	400	5 x 2	0.049
4	X	500	200	5 x 4	0.050
5	X	1000	400	5 x 2	0.049
6	X	1000	600	5 x 2	0.049
7	X	1000	1000	5 x 2	0.049

TABLE 2. Revised core experimental design for the 1992 Special-purpose Breeds trials.

Trt	Pruning	Thinning at age 8			
		Initial Planting	Final Crop Stocking	Initial Spacing	Plot area (ha)
1	X	500	500	5 x 4	0.050
2	✓	1000	400	5 x 2	0.049

Late Thinning Treatments

There are twelve trials with plots requiring a late thinning (Table 10). These are being carried out at the appointed time, by *Forest Research* staff with in kind help from the forest owners where qualified tree fellers are required. The first of these thinnings was completed in January 1998 in the 1984 genetic gain trial, RO1897. Four of the Silviculture/Breed trials (FR 7, 54, 84 and 85) have reached a MCH of 20m and the late thinning has been carried out to schedule. Of the remaining seven trials to be thinned, four will be thinned by the end of 2002. On current growth estimates, the remaining three will not be ready to be thinned until 2003/04. These estimated are revised annually, so that the required thinnings can be included in the current work programme.

Summary of Unscheduled Silvicultural Treatments

Treatment 6 (to be pruned with a production thin at 20m MCH) is no longer possible in the two Silviculture/Breed trials FR8 (Tahorakuri) and FR10 (Glengarry). Eight plots at each trial were thinned in error at plot establishment (MCH 6.2m), which means these plots are now equivalent to Treatment 2 (see Appendices 11 and 13).

The Silviculture/Breed trial FR8 (Tahourakuri), was given an unscheduled 2nd prune at the time the surrounding stand (October 1993, age 6) was given a pruning. All trees in the pruned plots were given a variable height prune to leave 4m of crown (see Appendix 11). The average prune height of the pruned plots is now 4.5m. One plot (treatment 5a) which was to have been unpruned was also pruned in error (Appendix 11). In addition, unscheduled thinning occurred during the regeneration cutting before plot establishment (Appendix 11). One plot (treatment 4a, Appendix 11) was thinned to 400 stems/ha instead of 600 stems/ha. The other plot (treatment 3a, Appendix 11) was thinned to 500 stems/ha. This plot was thinned to 400 stems/ha at the time of plot establishment according to the original plan.

In Silviculture/Breed trial FR78 two plots (treatment 1) were accidentally pruned after PSP plot establishment (Appendix 21) by local staff. Due to the pruning and mortality, these plots are now equivalent to treatment 4 (pruned and thinned to 400 stems/ha).

In Silviculture/Breed trial FR84 one plot (treatment 3) was accidentally pruned after PSP plot establishment (Appendix 22) by local staff. This plot is currently equivalent to treatment 4 (unthinned and pruned), but it is scheduled for a late thinning.

In Silviculture/Breed trial FR86, one plot (treatment 2) was accidentally pruned after PSP plot establishment (Appendix 24) by local staff. This plot is now equivalent to treatment 3.

In the Special-purpose Breed trial FR172/5 (Appendix 35), one plot of each seedlot in treatment 1 was pruned in 1998 before the new treatment schedule was agreed to. These plots should have been unpruned; now referred to as treatment 1b. Also, one plot of each seedlot in treatment 2 was pruned early (in 1998) before plot establishment in 2000.

In the Special-purpose Breed trial FR172/6 (Appendix 36), one plot of each seedlot in treatment 1 was pruned in 1998 before the new treatment schedule was agreed to. These plots should have been unpruned; now referred to as treatment 1b.

Summary of plots abandoned or not established

All plots with seedlot FRI78/2299 in the 1979/80 genetic gain trial series (RO2103/3, NN530/1 and SD682) were abandoned as this seedlot was found to be highly inbred and not representative of a GF14 rated seedlot.

Plots identified as being planted with the GF2 seedlot (R47/1027) at Aupouri in 1978, in trial AK1058, were abandoned as this seedlot was found to be incorrectly identified and the actual seedlot is unknown.

Several plots in the Silviculture/Breed and Special-purpose Breed trial series did not have PSP plots established or plots were abandoned at a later stage for various reasons (Table 3). Plots thinned to 100sph in the Silviculture/Breed series have also been abandoned at some sites due to the severity of undergrowth problems (gorse and blackberry), poor form caused by wind damage in the open grown plots and the time involved in remeasuring. Data from this treatment have not been used in any analysis to date.

TABLE 3. Trials with abandoned plots

Trial	Location	No. Plots	Reason for Abandonment
AK 1058	Aupouri	3	GF2 seedlot incorrectly identified
RO 2098	Kaingaroa	1	major wind damage and loss of trees
RO 2103/3	Kaingaroa	5	seedlot inbred
		3	plots in rep 1, poor planting & survival
		3	Dothistroma mortality in 1994
NN 530/1	Golden Downs	6	seedlot inbred
		3	major wind damage and loss of trees
SD 562	Dean	5	seedlot inbred
FR 8	Tahourakuri	6	100sph plots, severe weed problems, poor form
		6	local treatment not carried out, too costly
FR 11	Ditchlings	2	unusual spacing and mortality problem
		1	plot trees felled to clear power lines
FR 12	Otago Coast	1	not established, unable to distinguish plot trees
		1	severe wind damage
		6	100sph plots, severe weed problems, poor form
FR 56	Dalethorpe	3	not established, poor tree quality and mortality
		5	severe wind damage
FR 57	Tikokino	2	not established, high mortality
FR 77	Tikokino	1	not established, unable to locate plot trees
FR 78	Gwavas	12	not established, high mortality
FR 121/1	Tungrove	3	100sph plots, severe weed problems, poor form
FR 121/2	Kinleith	4	100sph plots, severe weed problems, poor form
FR 121/4	Tairua	2	100sph plots, severe weed problems, poor form
FR 121/5	Hokonui	27	the whole trial was abandoned due to heavy mortality and gorse throughout most plots
FR 121/8	Mangatu	2	not established, poor planting, high regen
FR 121/10	Blue Mountains	5	not established, high mortality
FR 121/12	Ashley	3	100sph plots, severe weed problems, poor form
FR 172/2	Riverhead	27	the whole trial was abandoned due to heavy gorse and poor growth throughout most plots
FR 172/5	Takitoa	5	additional local treatment plots not established
FR 172/6	Otago Coast	3	not established, high mortality
FR 215/2	Rakautao	2	not established, high mortality

Full details for these plots are documented in their respective Appendices.

Summary of Trials Abandoned

Three trials, FR58, FR59 and FR60 (Appendices 6, 7 & 8), were removed from the Cooperative trial remeasurement programme in 1995. These trials do not have any genetic comparisons, and therefore, cannot be used directly for quantifying genetic gain.

The Silviculture/Breed trial at Hokonui Forest, FR121/5, was abandoned due to extensive mortality, in November 1997, because of dense gorse and natural regeneration, the extent of the mortality was not realised fully until plot establishment at age 7. At other trials where there was mortality, the prescribed final crop stocking was achieved, sometimes without additional thinning. However, mortality was so extreme in this trial that no plots could be established at the prescribed stocking. Factors affecting the mortality seem to be the absence of land preparation, poor planting and poor root establishment.

The Special-purpose Breed trial planted at Riverhead Forest in 1992 was assessed in 1997 (age 5) with the average height being 4-6m depending on seedlot. By this time there were major problems with gorse growth up to 2m. It was agreed that the difficulties of finding the plot pegs and establishing plots, as well as the suppression of growth due to the gorse infestation did not justify the costly exercise of establishing and remeasuring PSPs. This trial, FR 172/2, was abandoned, before plot establishment, in 1999.

4. WORK PROGRAMME FOR COOPERATIVE TRIALS

In order to minimise the cost of remeasurement but maximise the pool of genetic gain data available, the remeasurement schedule was revised in 1999:

- 1975 trials to be removed from the genetic gain work programme.
- 1978-80 trials to continue on a two yearly schedule.
- 1984 trial, measure every two years from 2001.
- 1987-91 Silviculture/Breed trials, measure every year for 4 years after plot establishment, then every two years, with the exception of any late silviculture. After silviculture, trials will be measured annually for 3 years, then return to a two yearly schedule.
- 1992 and 1994 Special-purpose Breed trials, measure every year for 4 years after plot establishment, then every two years thereafter.

In 2001, it was also agreed that plots thinned to 100sph in the Silviculture/Breed series at the sites with severe undergrowth problems (gorse and blackberry) and consequently poor form caused by wind damage would be abandoned.

The initial stocking trial, RO972, has been clearfelled in 1998 and has been removed from the work programme. The genetic gain plots planted in 1975 were last measured in 1996 (age 21 years). These will have a final measurement taken at the time of clearfell at each site. Plots planted between 1978 - 1980 have been on a two yearly remeasurement schedule since 1996. The reduction in manweeks from the projected work programme in Report No. 40 is due to both the changes in.

The projected work programme to the year 2004 (Table 9) shows the current schedule and the number of plots to be measured during each year. The no of plots to be measured, the timing of remeasurements and improved measurement techniques have all contributed to a more cost efficient work programme over the years.

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ADDENDUM

TABLE 4a. Genetic Gain Trials supported by the Stand Growth Modelling Cooperative which were established in existing GTI trials.
Location details

PSP Expt No.	Planted Trial No.	Trial name ¹⁾	Forest name	Forest code	Cmpt No.	Forest Owner (as @ 2001)
RO972	R972	EFM Init. crop stocking	Rotoehu	ROEU	122	Fletcher Challenge Forests Ltd
AK1056	A622/1	GTI 850 polycross	Woodhill	WOOD	225, 230, 231	Carter Holt Harvey Forests Ltd
RO2098	R664/1	GTI 850 polycross	Kaingaroa	KANG	327	Fletcher Challenge Forests Ltd
NN529/1	N330/1	GTI 850 polycross	Golden Downs	GDNW	345	Weyerhaeuser NZ Ltd
CY597	C463	GTI 850 polycross	Eyrewell	EYWL	32	Carter Holt Harvey Forests Ltd
AK1058	A772/1	GTI 1978 genetic gain	Aupouri	AUPO	92	Juken Nissho Ltd
RO2103/1	RO1664/1	GTI 1978 genetic gain	Kaingaroa	KANG	1210	Fletcher Challenge Forests Ltd
RO2103/2	RO1664/2	GTI 1978 genetic gain	Kaingaroa	KANG	1210	Fletcher Challenge Forests Ltd
WN377	WN305	GTI 1978 genetic gain	Mohaka	MOHA	205	Pan Pac Forest Products Ltd
NN530/2	N405/1	GTI 1978 genetic gain	Golden Downs	GDNE	66	Weyerhaeuser NZ Ltd
CY421/1	CY421/1	GTI 1978 genetic gain	Waimate	WMTE	2	Crown Forestry Management Ltd
SD564/1	S564/1	GTI 1978 genetic gain	Longwood	LONG	62	Rayonier NZ Ltd
SD564/2	S564/2	GTI 1978 genetic gain	Longwood	LONG	62	Rayonier NZ Ltd
NN530/1	N405/4	GTI 1979 genetic gain	Golden Downs	GDNW	26	Weyerhaeuser NZ Ltd
RO2013/3	RO1664/6	GTI 1979 genetic gain	Kaingaroa	KANG	1218	Fletcher Challenge Forests Ltd
SD682	S425/2	GTI 1979 genetic gain	Dean	DEAN	251	Rayonier NZ Ltd
RO1897	RO1897	GTI 1984 genetic gain	Kaingaroa	KANG	327	Fletcher Challenge Forests Ltd

1) EFM = Exotic Forest Management; GTI = Genetics and Tree Improvement

TABLE 4b. Genetic Gain Trials supported by the Stand Growth Modelling Cooperative which were established in existing GTI trials
Planting details

PSP Expt No.	Planted trial No.	Trial Name ¹⁾	Growth Region	Site category ²⁾	Actual Site Index	Planting workplan	Mth/year planted	Reports/publications ³⁾
RO972	R972	EFM Initial crop stocking	Central North Island	High SI	35.6	604	7/70	PR1560, PR2501, PR2013, James (1979)
AK1056	A622/1	GTI 850 polycross	Sands	Med SI	25.7	GTI2095	7/75	WP1379, PR91, PR944, PR35, PR2013
RO2098	R664/1	GTI 850 polycross	Central North Island	Med SI	31.7	GTI2095	7/75	WP1379, PR91, PR944, PR35, PR2013
NN529/1	N330/1	GTI 850 polycross	Nelson	Low SI	28.1	GTI2095	7/75	WP1379, PR91, PR944, PR35, PR2013
CY597	C463	GTI 850 polycross	Canterbury	Low SI	21.7	GTI2095	6/75	WP1379, PR91, PR944, PR35, PR2013
AK1058	A772/1	GTI 1978 genetic gain	Sands	Low SI	26.1	GTI20212	8/78	WP1448, PR1689, PR478, PR2013
RO2103/1	RO1664/1	GTI 1978 genetic gain	Central North Island	High SI	35.6	GTI20212	7/78	WP1448, PR1689, PR478, PR2013
RO2103/2	RO1664/2	GTI 1978 genetic gain	Central North Island	High SI	35.4	GTI20212	7/78	WP1448, PR1689, PR478, PR2013
WN377	WN305	GTI 1978 genetic gain	Hawkes Bay	High BA	34.8	GTI20212	7/78	WP1448, PR1689, PR478, PR2013
NN530/2	N405/1	GTI 1978 genetic gain	Nelson	Med SI	29.2	GTI20212	8/78	WP1448, PR1689, PR478, PR2013
CY421/1	CY421/1	GTI 1978 genetic gain	Canterbury	Med SI	26.7	GTI20212	8/78	WP2071, PR1689, PR478, PR2013
SD564/1	S564/1	GTI 1978 genetic gain	Southland	High BA	26.7	GTI20212	8/78	WP2071, PR1689, PR478, PR2013
SD564/2	S564/2	GTI 1978 genetic gain	Southland	High BA	26.8	GTI20212	8/78	WP2071, PR1689, PR478, PR2013
NN530/1	N405/4	GTI 1979 genetic gain	Nelson	Med SI	30.7	GTI20177	8/79	WP1448, PR1633, PR2013
RO2103/3	RO1664/6	GTI 1979 genetic gain	Central North Island	High SI	34.8	GTI20177	7/79	WP1448, PR1633, PR2013
SD682	S425/2	GTI 1979 genetic gain	Southland	Med SI	28.9	GTI20177	8/80	WP1448, PR1633, PR2013
RO1897	RO1897	GTI 1984 genetic gain	Central North Island	Med SI	30.2	GTI20284	7/84	

1) EFM = Exotic Forest Management; GTI = Genetics and Tree Improvement

2) SI = site index; BA = basal area

3) WP = Work Plan; PR = FRI Project Record or Internal Report (many are also Forest Research/Industry Research Cooperative Reports)

TABLE 4c. Genetic Gain Trials supported by the Stand Growth Modelling Cooperative which were established in existing GTI trials
PSP details

PSP expt. No.	Planted trial no.	Trial name	Type of comparison	No. plots	PSP Estab workplan	PSP estab date	1st Assessment date ¹⁾	Current Measurement schedule	Expt. Design Details ²⁾ (Appendix No)
RO972	R972	EFM Init Crop Stocking	Init stocking/breeds	16	604	5/75	6/76	Clearfell 1998	1
AK1056	A622/1	GTI 850 polycross	Final crop stocking	24	1379	2/86	4/86	Triennial from 1996	2
RO2098	R664/2	GTI 850 polycross	Final crop stocking	23	1379	1/86	6/86	Triennial from 1996	2
NN529/1	N330/1	GTI 850 polycross	Final crop stocking	24	1379	2/86	5/86	Triennial from 1996	2
CY597	C463	GTI 850 polycross	Final crop stocking	24	1379	3/86	5/86	Triennial from 1996	2
AK1058	A772/1	GTI 1978 genetic gain	Genetic gain	18	1448	8/86	8/86	Biennial from 1998	3
RO2103/1	RO1664/1	GTI 1978 genetic gain	Genetic gain	24	1448	8/86	7/86	Biennial from 1998	3
RO2103/2	RO1664/2	GTI 1978 genetic gain	Genetic gain	24	1448	8/86	7/86	Biennial from 1998	4
WN377	WN305	GTI 1978 genetic gain	Genetic gain	18	1448	8/86	10/86	Biennial from 1998	3
NN530/2	N405/1	GTI 1978 genetic gain	Genetic gain	18	1448	8/86	9/86	Biennial from 1998	3
CY421/1	CY421/1	GTI 1978 genetic gain	Genetic gain	12	2071	12/91	5/92	Biennial from 1998	3
SD564/1	S564/1	GTI 1978 genetic gain	Genetic gain	12	2071	12/91	5/92	Biennial from 1998	3
SD564/2	S564/2	GTI 1978 genetic gain	Genetic gain	11	2071	12/91	5/92	Biennial from 1998	4
NN530/1	N405/4	GTI 1979 genetic gain	Genetic gain	18	1448	9/86	9/86	Biennial from 1998	5
RO2103/3	RO1664/6	GTI 1979 genetic gain	Genetic gain	15	1448	4/86	11/86	Biennial from 1998	5
SD682	S425/2	GTI 1979 genetic gain	Genetic gain	19	1448	6/86	7/86	Biennial from 1998	5
RO1987	RO1987	GTI 1984 genetic gain	Genetic gain	66	20284	1/90	1/90 ³⁾	Biennial from 2000	9

1) Height and diameter measured

2) Appendices 6, 7 & 8 detail trials FR 58, 59 & 60 respectively. These trials have been taken out of the Stand Growth Modelling Cooperative programme.

3) Twelve plots of the 66 were established and measured in 1991. See Appendix 9 for details

TABLE 5a. Silviculture/Breed Trials supported by the Stand Growth Modelling Cooperative
Location details

Trial No.	Planting year	Forest	Forest code	Cmpt No.	Forest Owner (as @ 2001)	Growth Region	Site category	Actual Site Index
FR7	87	Woodhill	WOOD	86	Carter Holt Harvey Forests Ltd	Sands	Med SI	26.2
FR8	87	Tahorakuri	TAHO	8342	Fletcher Challenge Forests Ltd	Central North Island	Med SI	33.1
FR9	87	Kaingaroa	KANG	481	Fletcher Challenge Forests Ltd	Central North Island	Low SI	23.5
FR10	87	Glengarry	GLNG	180	Carter Holt Harvey Forests Ltd	Hawkes Bay	High BA	35.0
FR11	87	Ditchlings	DTLG	26	Weyerhaeuser NZ Ltd	Nelson	Low SI	29.7
FR12	87	Otago Coast	OTCO	170	Wenita Forest Products Ltd	Southland	High BA	25.1
FR54	88	Mamaranui	MMRN	0	Carter Holt Harvey Forests Ltd	Auckland Clays	High BA	32.6
FR55	88	Eyrewell	EYWL	33	Carter Holt Harvey Forests Ltd	Canterbury	Low SI	24.5
FR56	88	Dalethorpe	DALE	0	Selwyn Plantation Board	Canterbury	Med SI	22.3
FR57	88	Tikokino	TIKO	0	NZ Forest Research Institute Ltd	Hawkes Bay	High SI	29.5
FR77	89	Tikokino	TIKO	0	NZ Forest Research Institute Ltd	Hawkes Bay	High SI	30.4
FR78	89	Gwavas	GWAV	59	Pan Pac Forest Products Ltd	Hawkes Bay	Med SI	29.3
FR84	89	Kawerau	KAWK	7	Carter Holt Harvey Forests Ltd	Central North Island	High BA	39.8
FR85	89	Kaingaroa	KANG	1187	Fletcher Challenge Forests Ltd	Central North Island	Med SI	34.3
FR86	89	Golden Downs	GDNW	112	Weyerhaeuser NZ Ltd	Nelson	Med SI	30.2
FR121/1	90	Tungrove	TGRV	3148	Carter Holt Harvey Forests Ltd	Auckland Clays	Med SI	31.9
FR121/2	90	Atiamuri	ATIA	7316	Carter Holt Harvey Forests Ltd	Central North Island	Med SI	39.0
FR121/3	90	Gwavas	GWAV	45	Pan Pac Forest Products Ltd	Hawkes Bay	Low SI	29.4
FR121/4	90	Tairua	TIRU	120	Carter Holt Harvey Forests Ltd	Auckland Clays	High SI	35.3
FR121/5	90	Hokonui	HOKO	3	Rayonier NZ Ltd	Southland	High SI	-
FR121/6	90	Tarawera	TAWK	30	Fletcher Challenge Forests Ltd	Central North Island	High SI	33.2
FR121/7	90	Huanui	HNUI	18	Hikurangi Forest Farms Ltd	East Coast	High BA	31.4
FR121/8	91	Mangatu	MANT	10	Rayonier NZ Ltd	East Coast	Med SI	32.5
FR121/9	91	Santoft	SANT	108	Ernslaw One Ltd	Sands	Low SI	21.5
FR121/10	91	Blue Mountains	BLUE	325	Ernslaw One Ltd	Southland	Low SI	24.2
FR121/11	91	Shellocks	SHEL	36	Selwyn Plantation Board	Canterbury	Low SI	23.5
FR121/12	91	Ashley	ASHY	19	Carter Holt Harvey Forests Ltd	Canterbury	High SI	28.9
FR121/13	91	Golden Downs	GDNE	133	Weyerhaeuser NZ Ltd	Nelson	High SI	30.2

TABLE 5b. Silviculture/Breed Trials supported by the Stand Growth Modelling Cooperative
PSP details

Planting year	Trial No.	Forest	Planting Work Plan	Estab. Report	No. plots Planted	Expt. design Details (App. No.)	First Height meas. (mth/yr)	First Winter Assessment	PSP estab.
87	FR7	Woodhill	1585	PR1767	54	10	5/89	6/93	11/92
87	FR8	Tahorakuri	1585	PR1767	54	11	9/88	5/92	3/92
87	FR9	Kaingarua	1585	PR1767	48	12	7/89	5/94	2/94
87	FR10	Glengarry	1585	PR1767	54	13	7/89	6/92	2/92
87	FR11	Ditchlings	1585	PR1767	48	14	8/89	7/93	1/93
87	FR12	Otago Coast	1585	PR1767	48	15	8/89	6/94	3/94
88	FR54	Mamaranui	1633	PR2540	44	16	5/90	5/93	10/92
88	FR55	Eyrewell	1633	PR2540	22	17	5/90	5/95	12/94
88	FR56	Dalethorpe	1633	PR2540	44	18	5/90	5/95	3/95
88	FR57	Tikokino	1633	PR2540	42	19	8/91	6/94	12/93
89	FR77	Tikokino	1633	PR2544	30	20	8/91	5/95	11/94
89	FR78	Gwavas	1633	PR2544	30	21	8/91	6/95	1/95
89	FR84	Kawerau	1633	PR2544	36	22	6/91	4/94	10/93
89	FR85	Kaingarua	1633	PR2544	42	23	5/91	4/94	1/94
89	FR86	Golden Downs	1633	PR2544	16	24	12/91	5/95	2/95
90	FR121/1	Tungrove	1633	PR2781	25	25	4/92	4/96	9/95
90	FR121/2	Atiamuri	1633	PR2781	32	26	5/92	7/95	2/95
90	FR121/3	Gwavas	1633	PR2781	22	27	6/92	5/96	12/95
90	FR121/4	Tairua	1633	PR2781	18	28	8/92	8/95	10/94
90	FR121/5	Hokonui	1633	PR2781	27	29	6/92	-	Aband 11/97
90	FR121/6	Tarawera	1633	PR2781	25	25	4/92	8/95	3/95
90	FR121/7	Huanui	1633	PR2781	18	28	6/92	7/95	11/94
91	FR121/8	Mangatu	1980	PR3027	25	30	12/94	8/96	1/96
91	FR121/9	Santoft	1980	PR3027	25	31	4/93	4/98	10/97
91	FR121/10	Blue Mountains	1980	PR3027	25	32	6/93	6/99	3/99
91	FR121/11	Shellocks	1980	PR3027	25	31	5/93	5/99	2/99
91	FR121/12	Ashley	1980	PR3027	25	33	5/93	5/97	11/96
91	FR121/13	Golden Downs	1980	PR3027	25	31	5/93	7/97	2/97

TABLE 6a. Special-Purpose Breed Trials supported by the Stand Growth Modelling Cooperative
Location details

Trial No.	Planting year	Forest	Forest code	Cmpt No.	Forest Owner (as @ 2001)	Growth Region	Site category	Actual Site Index
FR172/1	92	Woodhill	WOOD	36	Carter Holt Harvey Forests Ltd	Sands	Low SI	25.6
FR172/2	92	Riverhead	RVHD	25	Carter Holt Harvey Forests Ltd	Auckland Clays	High SI	-
FR172/3	92	Kaingaroa	KANG	1276	Fletcher Challenge Forests Ltd	Central North Island	Med SI	32.0
FR172/4	92	Kinleith	KINL	6216	Carter Holt Harvey Forests Ltd	Central North Island	High SI	43.2
FR172/5	92	Takitua	TAKI	5	City Forests Ltd	Southland	High BA	29.8
FR172/6	92	Otago Coast	OTCO	11	Wenita Forest Products Ltd	Southland	Med SI	29.0
FR215/1	94	Kaingaroa	KANG	1284	Fletcher Challenge Forests Ltd	Central North Island	High SI	33.2
FR215/2	94	Rakautao	RKAT	18	Carter Holt Harvey Forests Ltd	Northland	High BA	36.3
FR215/3	94	Tokoiti	TOIT	41	City Forests Ltd	Southland	High BA	31.0

TABLE 6b. Special-Purpose Breed Trials supported by the Stand Growth Modelling Cooperative
PSP details

Planting year	Trial No.	Forest	Planting Work Plan	Estab. Report	No. plots Planted	Expt. design Details (App. No.)	First Winter Assessment	PSP estab.
92	FR172/1	Woodhill	2151	GTI29/14	32	34	6/01	2/01
92	FR172/2	Riverhead	2151	GTI29/14	32	34	-	Aband 1999
92	FR172/3	Kaingaroa	2151	GTI29/14	32	34	4/00	11/99
92	FR172/4	Kinleith	2151	GTI29/14	32	34	5/00	12/99
92	FR172/5	Takitoa	2151	GTI29/14	40	35	6/00	2/00
92	FR172/6	Otago Coast	2151	GTI29/14	28	36	6/00	2/00
94	FR215/1	Kaingaroa	2295	GTI29/18	36	37	4/00	11/99
94	FR215/2	Rakautao	2295	GTI29/18	36	38	7/01	9/00
94	FR215/3	Tokoiti	2295	GTI29/18	36	39	6/01	10/00

TABLE 7.

Planting year for **Silvicultural and Special-Purpose Breed Trials**
representing a matrix of regions and site categories

Region	Site category ¹⁾			
	High basal area	High site Index	Medium site index	Low site index
Auckland clays	'88, '94	'90	'90	
Sands	NA ²⁾	NA	'87	'91
Central North Island	'89	'90, '92, '94	'87, '89, '90, '92	'87
Hawkes Bay	'87	'88, '89	'89	'90
East Coast	'90		'91	
Nelson		'91	'89	'87
Southland	'87, '92, '94	'90	'92	'91
Canterbury	NA	'91	'88	'88, '91

¹⁾ Classifications apply **within** Regions

²⁾ NA = not applicable

TABLE 8. Seedlot comparisons in trials supported by the Stand Growth Modelling Cooperative

Growth modelling region	Site category	Year planted	PSP Expt. No.	Seedlot ratings	Appendix
Auckland Clays	High SI	1990	FR121/4	GF7, GF14, GF16, GF25	28
	Med SI	1990	FR121/1	GF7, GF14, GF16, GF25, LI25 (GF13)	25
	Low SI	-			
	High BA	1988	FR54	GF14, GF17, GF22, LI23 (GF9)	16
Sands		1994	FR215/2	GF7, GF14, GF18, GF25, GF30, LI27(GF15)	38
	High SI	-			
	Med SI	1975	AK1056	GF14	2
		1987	FR7	GF7, GF14, GF19, GF21, LI28 (GF13)	10
	Low SI	1978	AK1058	GF2, GF7, GF14, GF22	3
		1991	FR121/9	GF6, GF14, GF16, GF25, LI25 (GF13)	31
		1992	FR172/1	GF7, GF14, GF18, GF27, GF28, LI25 (GF13)	34
Central Nth Island	High BA	-			
	High SI	1970	RO972	GF4, GF13	1
		1978	RO2103/1	GF2, GF7, GF14, GF22	3
		1978	RO2103/2	GF2, GF7, GF14, GF22	4
		1979	RO2103/3	GF7, GF8, GF14, GF18, LI19 (GF8)	5
		1990	FR121/6	GF7, GF14, GF16, GF25, LI25 (GF13)	25
		1992	FR172/4	GF7, GF14, GF18, GF27, GF28, LI25 (GF13)	34
		1994	FR215/1	GF7, GF14, GF18, GF25, GF30, LI27(GF15)	37
	Med SI	1975	RO2098	GF14	2
		1984	RO1897	GF7,GF14,GF16,GF17,,LI20(GF10),LI25(GF11)	9
		1987	FR8	GF7, GF14, GF21, LI28 (GF13)	11
		1989	FR85	GF2, GF16, GF18, GF22, GF23, GF25	23
		1990	FR121/2	GF7, GF14, GF16, GF25, LI25 (GF13)	26
		1992	FR172/3	GF7, GF14, GF18, GF27, GF28, LI25 (GF13)	34
	Low SI	1987	FR9	GF7, GF14, GF21, LI28 (GF13)	12
	High BA	1989	FR84	GF2, GF16, GF25	22
	Hawkes Bay	High SI	1988	FR57	GF17, GF19, LI20 (GF7)
		1989	FR77	GF2, GF16, GF23, GF25	20
Med SI		1989	FR78	GF2, GF16, GF23, GF25	21
Low SI		1990	FR121/3	GF7, GF14, GF16, GF25, LI25 (GF13)	27
High BA		1978	WN377	GF2, GF7, GF14, GF22	3
		1987	FR10	GF7, GF14, GF16, GF21, LI28 (GF13)	13
East Coast		High SI	-		
	Med SI	1991	FR121/8	GF6, GF14, GF16, GF25, LI25 (GF13)	30
	Low SI	-			
Nelson	High BA	1990	FR121/7	GF7, GF14, GF16, GF25	28
	High SI	1991	FR121/13	GF6, GF14, GF16, GF25, LI25 (GF13)	31
	Med SI	1978	NN530/2	GF2, GF7, GF14, GF22	3
		1979	NN530/1	GF7, GF8, GF14, GF18, LI19 (GF8)	5
		1989	FR86	GF2, GF16, GF23, LI27 (GF6)	24
	Low SI	1975	NN529/1	GF14	2
		1987	FR11	GF7, GF14, GF21, LI28, (GF13)	14
	High BA	-			

TABLE 8 cont. Seedlot comparisons in trials supported by the Stand Growth Modelling Cooperative

Growth modelling region	Site category	Year planted	PSP Expt. No.	Seedlot ratings	Appendix
Southland	High SI	1990	FR121/5	GF7, GF14, GF16, GF25, LI25 (GF13)	29
	Med SI	1980	SD682	GF7, GF8, GF14, GF18, LI19 (GF8)	5
		1992	FR172/6	GF7, GF14, GF18, GF27, GF28, LI25 (GF13)	36
	Low SI	1991	FR121/10	GF6, GF14, GF16, GF25, LI25 (GF13)	32
	High BA	1978	SD564/1	GF2, GF7, GF14, GF22	3
		1978	SD564/2	GF2, GF7, GF14, GF22	4
		1987	FR12	GF7, GF14, GF21, LI28 (GF13)	15
		1992	FR172/5	GF7, GF14, GF18, GF27, GF28, LI25 (GF13)	35
		1994	FR215/3	GF7, GF14, GF18, GF25, GF30, LI27(GF15)	39
	High SI	1991	FR121/12	GF6, GF14, GF16, GF25, LI25 (GF13)	33
Canterbury	Med SI	1978	CY421/1	GF2, GF7, GF14, GF22	3
		1988	FR56	GF14, GF17, GF22, LI23 (GF9)	18
	Low SI	1975	CY597	GF14	2
		1988	FR55	GF16, GF17, GF22	17
		1991	FR121/11	GF6, GF14, GF16, GF25, LI25 (GF13)	31
	High BA	-			

Table 9.**PROJECTED WORK PROGRAMME 2000-2004**

Expt No.	Forest	Owner	Plant Year	Month Meas.	Late Thin	2000/01	2001/02	2002/03	2003/04
AK 1058	AUPO	JUKN	78	July		15		15	
RO 2103/1	KANG	FCF	78	June			24		24
RO 2103/2	KANG	FCF	78	June			24		24
WN 377	MOHA	PPFP	78	Aug		18		18	
NN 530/2	GDNE	WEYH	78	July		18		18	
CY 421	WMTE	RMNZ	78	May			12		12
SD 564/1	LONG	RAYN	78	June			12		12
SD 564/2	LONG	RAYN	78	June			11		11
NN 530/1	GDNW	WEYH	79	July		18	18		15
RO 2103/3	KANG	FCF	79	June		12		12	
SD 682	DEAN	RAYN	80	June		24	24		24
RO 1897	KANG	FCF	84	July	'97	66		66	
FR 7	WOOD	CHHF	87	June	'00	54	54	54	54
FR 8	TAHO	FCF	87	April			40		40
FR 9	KANG	FCF	87	May	'03		48		48
FR 10	GLNG	CHHF	87	May			54		54
FR 11	DTLG	WEYH	87	July	'01	45		45	45
FR 12	OTCO	WENT	87	June	'03		39		39
FR 54	MMRN	CHHF	88	May	'99	42	42	42	
FR 55	EYWL	CHHF	88	May		22		22	
FR 56	DALE	SELW	88	May	'04	34		34	
FR 57	TIKO	NZFRI	88	May	'02	40	40	40	40
FR 77	TIKO	NZFRI	89	May	'02	35	35	35	35
FR 78	GWAV	PPFP	89	June	'02	24	24	24	24
FR 84	KAWE	CHHF	89	April	'98	36		36	
FR 85	KANG	FCF	89	April	'00	42	42	42	
FR 86	GDNW	WEYH	89	July			16		16
FR 121/1	TUNG	CHHF	90	April		22		22	
FR 121/2	KINL	CHHF	90	Aug			27		27
FR 121/3	GWAV	PPFP	90	May		22		22	
FR 121/4	TIRU	CHHF	90	Aug			16		16
FR 121/6	TAWA	FCF	90	Aug			25		25
FR 121/7	HNUI	HFF	90	July			18		18
FR 121/8	MANT	RAYN	91	August		23	23	23	
FR 121/9	SANT	ERNS	91	April		25	25		25
FR 121/10	BLUE	ERNS	91	June		20	20		20
FR 121/11	SHEL	SELW	91	May		25	25		25
FR 121/12	ASHY	CHHF	91	May		25	25		25
FR 121/13	GDNE	WEYH	91	July		25	25	25	
Total No. of Plots measured by year						732	788	595	698

Table 9 cont.**PROJECTED WORK PROGRAMME 2000-2004**

Expt No.	Forest	Owner	Plant Year	Month Meas.	Late Thin	2000/01	2001/02	2002/03	2003/04
FR 172/1	WOOD	CHHF	92	June		27	27	27	27
FR 172/3	KANG	FCF	92	April		27	27	27	27
FR 172/4	KINL	CHHF	92	May		27	27	27	27
FR 172/5	TAKI	CFL	92	June		35	35	35	35
FR 172/6	OTCO	WENT	92	June		25	25	25	25
FR 215/1	KANG	FCF	94	April		36	36	36	36
FR 215/2	RKAT	CHHF	94	July		31	31	31	31
FR 215/3	TOIT	CFL	94	June		33	33	33	33
Total No. of Plots measured by year						241	241	241	241

Table 10.

Silviculture/Breeds Trials - Schedule of late thinnings

Timing of thinning at 20m MCH

PLOT ID	Forest	Owner	MCH	Mean DBH	Initial Stocking	Final Stocking	No. Plots	Actual	
								Thin Date	Thin Age
RO 1897	KANG	FCFL	20		700	400	12	Jan-98	14
					700	300	12	Jan-98	14
FR 7	WOOD	CHHF	14.7	23.5	500	200	8	Sep-00	13
FR 54	MMRM	CHHF	15.8	31.6	500	200	6	Jan-00	12
FR 84	Kawe	CHHF	19.9	30.1	600	250	12	Sep-98	9
FR 85	KANG	FCFL	20.7	29.9	833	250	14	Apr-01	12

PLOT ID	Forest	Owner	Age @ 2001	Current MCH	Current Mean DBH	Current Stocking	Final Stocking	No. Plots	Estimated	
									Thin Date	Thin Age
FR 9	KANG	FCFL	13	15.3	28.4	500	200	8	2003	16
FR 11	DTLG	WEYH	13	18.1	34.0	500	200	8	2001	14
FR 12	OTCO	WENT	13	14.3	33.6	500	200	8	2003	16
FR 56	DALE	SELW	13	13.2	33.9	500	200	6	2004	16
FR 57	TIKO	NZFRI	13	18.7	36.7	500	200	6	2002	14
FR 77	TIKO	NZFRI	12	17.9	37.2	500	200	6	2002	13
FR 78	GWAV	PPFP	12	18.1	37.5	500	200	6	2002	13

APPENDIX 1

Experimental design for completely randomised **Initial Crop Stocking Trial** planted in **1970** at **Rotoehu (RO972)**.
Each dot represents one large plot with a PSP¹⁾

Trt	Pruning	Silviculture					Thinning			Planting stock		
		Stocking (stems/ha)					MCH			Seedlings		
		Initial	1st interim	2nd interim	Final	1st MCH (m)	2nd MCH (m)	3rd MCH (m)	Ratio	GF4 (R67/795)	GF13 (WN68/A1)	Cuttings ²⁾
1	2.2m, 4.2m, 6m	250	250	250	250	-	-	-	1:1	••	••	
2	"	500	500	500	250	-	-	12	2:1	••	••	
3	"	750	750	500	250	-	8.2	12	3:1	••	••	••
4	"	1000	750	500	250	6.2	8.2	12	4:1	••	••	
5	"	1250	750	500	250	6.2	8.2	12	5:1	••	••	
6	"	1500	750	500	250	6.2	8.2	12	6:1	••	••	

1) Sixteen PSP's established 1975.

Data available: RO972: Height and diameter annually 1975-1983, then biennially from 1985-1995.
Final measurement taken in 1998 for 10 plots only.

2) Cuttings from older trees (probably about 8-9 years old) of uncertain breed, probably unselected.

TRIAL CLEARFELLED in 1998

APPENDIX 2

Experimental design for randomised complete block Final Crop Stocking Trial planted in 1975 (as GTI "850 Polycross" trial) at Woodhill (AK1056), Kaingaroa Cpt 327 (RO2098), Golden Downs (NN529/1) and Eyrewell (CY597).

Each dot represents one large plot with a PSP¹⁾

Trt	Silviculture							Planting stock	
	Pruning		Stocking (stems/ha)		Thinning		Ratio	Seedlings	GF14 polycross 2)
	Ht (m)/ Age (yrs)	Ht (m)/ Age (yrs)	Ht (m)/ Age (yrs)	Initial	Final	Prescribe MCH (m)			
1	2.2 / 8	4.2 / 9	6 / 11 ³⁾	625	100	12	11	6.25:1	●●●
2	"	"	"	625	200	12	11	3.1:1	●●●
3	"	"	"	625	400	12	11	1.6:1	●●●
4	"	"	"	625	625	-		1:1	●●●●●(▲)
5	"	"	"	625	100	20	14	6.25:1	●●●
6	"	"	"	625	200	20	14	3.1:1	●●●
7	"	"	"	625	400	20	14	1.6:1	●●●

1) PSP's established 1986.

Data available: AK1056, RO2098, NN529/1, CY597 - Height and diameter annually 1986-1994, then 1996. A final measurement will be taken at the time of clearfell at each site.

One plot (shown as ▲) was abandoned at RO2098 in 1989 due to major wind damage and loss of trees.

- Single-tree-plot progeny trial consisting of offspring from 100 mothers (most are "850" series selections from both the North and South Islands) crossed with a pollen mix of 10 North Island "850" series parents, plus four controls, CY74/701 (Southland orchard - Amberley); CY74/700 (Canterbury orchard - Amberley); WN72/A2 (Gwavas seed orchard); R69/854 (Kaingaroa bulk unselected).
- Best 200 stems/ha pruned to 6 m at Kaingaroa (RO2098) and Golden Downs (NN529). No high pruning at Eyrewell (CY597).

APPENDIX 3

Experimental design for randomised complete block 1978 Genetic Gain Trial (sawlog regime) planted in 1978 at Aupouri (AK1058), Kaingaroa Cpt 1210 (RO2103/1), Mohaka (WN377), Golden Downs (NN530/2), Longwood (SD564/1) and Waimate (CY421/1).

Each dot represents one large plot with a PSP1) 2).

Silviculture					Site		Planting stock				
Trt	Pruning	Stocking (stem/ha)			Thinning		GF2 (R74/1027)	GF7 4)	GF14 (WN76/2)	GF22 5) (850-55 x 850-96)	
		Initial	Interim	Final	1st MCH (m)	2nd MCH (m)					Ratio
1	2.2m, 4.2m, 6m	1111	600	300	6.2	12	3.7:1	Aupouri 1)	▲ ▲ ▲	● ● ● ● ●	● ● ●
								Mohaka 1)	● ● ●	● ● ● ● ●	● ● ●
								Kaingaroa 1)	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●
								Golden Downs 1)	● ● ●	● ● ● ● ●	● ● ●
								Longwood 2)	● ● ●	● ● ●	● ● ●
								Waimate 2)	● ● ●	● ● ●	● ● ●

1) Twelve PSP's were established at each of 4 sites in GF7 and GF14 in 1986 and six PSP's in the GF2 and GF22 plantings in 1991-93 (Appendix 4a).

Data available: AK1058, RO2103/1, NN530/2, WN377: Height and diameter annually 1986 to 1998, (GF2 & 22 1991 to 1998 only), biennially thereafter.
(Note: WN 377 not measured in 1989 and 1991)

▲ Three plots abandoned at AK1058 where the GF2 seedlot has been found to be incorrectly identified, actual seedlot unknown (data not used for analysis)

2) Twelve PSP's were established at each of two sites in 1991 (Appendix 4a).

Data available: CY421/1, SD564/1: Height and diameter annually 1991 to 1998, biennially thereafter.

3) Three additional seedlots (6 reps) are included on all sites in this experiment but are not being monitored with PSP's. They are:
GF10 (GF13 in Southland), CY/C/75/52; GF8, CY/C/75/51; GF16, FRI 76/2052

4) Local climbing select seedlots have been arbitrarily assigned a GF7. They are:

Kaingaroa climbing select RO/C/76/1 at Aupouri (AK1058) and Kaingaroa (RO2103/1), Ngaumu climbing select WN/75/15 at Mohaka (WN377),
Golden Downs climbing select NN/C/75/2 at Golden Downs (NN530/2), Balmoral climbing select CY/C/75/40 at Waimate (CY421/1), Rankleburn
climbing select SD/C/75/27 at Longwood (SD564/1)

5) Only a small number of parents have contributed to the seedlot mix, thus less confidence should be placed on the GF rating

APPENDIX 4

Experimental design for randomised complete block 1978 Genetic Gain Trial (pulpwood regime) planted in 1978 at Kaingaroa Cpt 1210 (RO2103/2) and Longwood (SD564/2).

Each dot represents one large plot with a PSP 1)2)

Silviculture				Site	Planting stock		
Trt	Pruning	Stocking (stems/ha)			Seedlings 3)		
		Initial	Final	Ratio			
1	2.2 m	711	711	1:1	Kaingaroa 1)	••••••	••••••
					Longwood 2)	•••	•••
						•••	••

1) Twelve PSP's were established at Kaingaroa in GF7 and GF14 in 1986, six PSP's in each of the GF2 and GF22 plantings in 1991 (Appendix 4a).
Data available: RO2103/2: Height and diameter annually 1986 to 1998, (GF2 & 22 1991 to 1998 only), biennially thereafter.

2) Eleven PSP's were established at Longwood in 1991 (Appendix 4a).
Data available: SD564/2: Height and diameter annually 1991 to 1998, biennially thereafter.

3) Three additional seedlots (6 reps) are included on all sites in this experiment but are not being monitored with PSP's. They are:
GF10 (GF13 in Southland) - CY/C/75/52, GF8 (GF14 in Canterbury) - CY/C/75/51, GF16 - FRI 76/2052

4) Local climbing select seedlots have been arbitrarily assigned a GF7. They are:
Kaingaroa climbing select RO/C/76/1 Kaingaroa (RO2103/2)
Rankleburn climbing select SD/C/75/27 at Longwood (SD564/2)

5) Only a small number of parents have contributed to the seedlot mix, thus less confidence should be placed on the GF rating

APPENDIX 4A

Plots established in the 1978 Genetic Gain Trials by year.

Trial	Site	No. of PSP's Added				Year	No. plots
		GF2	GF7	GF14	GF22		
AK 1058	Aupouri	-	6	6	-	1986	12
		3	-	-	3	1992	6
TOTAL		3	6	6	3		18
RO 2103/1	Kaingaroa	-	6	6	-	1986	12
		3	-	-	3	1991	6
		3	-	-	3	1993	6
TOTAL		6	6	6	6		24
RO 2103/2	Kaingaroa	-	6	6	-	1986	12
		6	-	-	6	1991	12
TOTAL		6	6	6	6		24
WN 377	Mohaka	-	6	6	-	1986	12
		-	-	-	2	1991	2
		3	-	-	1	1992	4
TOTAL		3	6	6	3		18
NN 530/2	Golden Downs	-	6	6	-	1986	12
		3	-	-	3	1991	6
TOTAL		3	6	6	3		18
CY 421/1	Waimate	3	3	3	3	1991	12
TOTAL		3	3	3	3		12
SD 564/1	Longwood	3	3	3	3	1991	12
TOTAL		3	3	3	3		12
SD 564/2	Longwood	3	3	3	2	1991	11
TOTAL		3	3	3	2		11

APPENDIX 5

Experimental design for randomised complete block 1979 Genetic Gain Trial planted in 1979 at Kaingaroa, Cpt 1218 (RO2103/3) and Golden Downs (NN530/1), and in 1980 at Dean (SD682).

Each dot represents one large plot with a PSP1

Silviculture										Site		Planting stock	
Trt	Pruning	Stocking (stem/ha)			Thinning			GF7 2)	GF8 (CY/C/75/51)	GF14 4) (FRI78/2299)	GF14 5) (FRI78/2300)	LJ19 (GF8) (FRI78/2301)	
		Initial	Interim	Final	1st MCH (m)	2nd MCH (m)	Ratio						
1	2.2m, 4.2m, 6m	1111	600	300	6	12	3.7:1	••••▲	3)	▲▲▲▲▲	••••▲	••••▲	
							Golden Downs 7)	•••••▲	3)	▲▲▲▲▲	•••••▲	•••••▲	
							Dean	•••	•••••	▲▲▲▲▲	•••••	•••••	

- 1) PSP's established 1986.
Data available: RO2103/3, NN530/1, SD 682; Height and diameter annually from 1986-1998, biennially thereafter.
- 2) Local climbing select seedlots have been arbitrarily assigned a GF7. They are:
Kaingaroa climbing select, RO/C/76/1, at Kaingaroa (RO2103/3) and Golden Downs (NN530/1),
Rangleburn Cpt 17 climbing select, SD/C/76/2, at Dean (SD682).
- 3) Up to 6 replications of seedlot CY/C/75/51 are not being monitored at Kaingaroa (RO2103/3) and Golden Downs (NN530/1).
- 4) Seedlot FRI78/2299 was found to be highly inbred and plots (shown as ▲) were abandoned.
- 5) Seedlot FRI78/2300 was originally rated as GF18, but is now considered to be equivalent to GF14 for growth modelling purposes (see Cooperative Report No. 35).
- 6) All plots in replication 1 at Kaingaroa were abandoned before plot establishment due to low survival and poor form. Three plots were abandoned in 1994 due to *Dothistroma* mortality and poor form, plots shown as ▲.
- 7) At Golden Downs three plots were abandoned in 2001 due to severe wind damage, plots shown as ▲.

APPENDIX 6

Silviculture and seedlot for **Silviculture Comparison** established in the Best Practices trial planted in 1982 at **Riverhead (FR58)**.

Each dot represents one large plot with a PSP¹⁾

Trt	Silviculture							Planting Stock
	Pruning	Stocking (stems/ha)			Thinning			Seedlings
		Initial	Interim	Final	1st	2nd	Ratio	GF14 (3/3/80/2)
1	250 stems to 3 m, 4.5 m, 6 m	1600	500	250	age 6	age 7-8	6.4:1	•••
2	250 stems to 4.5 m	1600	1000	250	3m	age 6	6.4:1	•••

1) PSP's established 1988.

Data available: FR58: Height and diameter 1988, 1989 and 1992-95.

Trial taken out of the New/Breeds remeasurement programme in 1995.

No genetic comparisons - cannot be used directly for genetic gain analysis. Plots are now being measured biennially as general growth monitoring plots.

APPENDIX 7

Silviculture and seedlot for **Silviculture/Site Comparison** established in "880" series progeny trial planted in 1981 at **Waiomio (FR59)**.

Each dot represents one large plot with a PSP¹⁾

Trt	Silviculture					Planting stock
	Pruning	Stocking (stems/ha)		Thinning		Seedlings
		Initial	Final	Age	Ratio	GF16 (approx.) ²⁾
1	2.2 m, 4.2 m, 6 m	816	350	8	5.1:1	...
2	2.2m	816	816	-	1:1	...

1) PSP's established 1988.

Data available: FR59: Height and diameter annually 1988-92 and 1994.

2) Single-tree-plot progeny trial consisting primarily of approximately 170 open-pollinated offspring from "880" series ortets. Ortets are in the "268" series progeny trial planted at Kaingaroa Cpt 1350.

Trial taken out of the New/Breeds remeasurement programme in 1995.

No genetic comparisons - cannot be used directly for genetic gain analysis. Plots are now being measured biennially as general growth monitoring plots.

APPENDIX 8

Silviculture and seedlot for **Final Crop Stocking Comparison** established in the '268 x 875' Paircross progeny trial planted in 1982 at **Weiti Station** (FR60).

Each dot represents one large plot with a PSP¹⁾

Trt	Silviculture				Planting stock	
	Pruning	Stocking (stems/ha)		Thinning		Seedlings
		Initial	Final	Age	Ratio	GF16 (approx.) ²⁾
1	2.2 m, 4.2 m, 6 m	625	100	6	6.3:1	●●●
2	"	625	200	6	3.1:1	●●●
3	"	625	300	6	2.1:1	●●●
4	"	625	400	6	1.6:1	●●●

- 1) PSP's established 1988.

Data available: FR60: Height and diameter annually 1988-1994.

- 2) Single-tree plot progeny trial consisting primarily of 128 crosses of "268" x "875" series parents.

Trial taken out of the New/Breeds remeasurement programme in 1995

No genetic comparisons - cannot be used directly for genetic gain analysis. Plots are now being measured biennially as general growth monitoring plots.

APPENDIX 9

Experimental design for randomised complete block **1984 Genetic Gain Trial** planted in **1984** at **Kaingaroo Cpt 327 (RO1897)**.
Each dot represents one large plot with a PSP 1) 2)

Silviculture				Planting stock 3)							Cuttings	
Trt	Pruning	Stocking (stems/ha)		Thinning 4)		Seedlings						
		Initial	Final	MCH (m)	Ratio	GF7 (FRI79/2320)	GF14 (3/3/83/2)	GF16 (9/0/83/91)	GF17 (9/0/83/96)	LI25 (GF11) (9/0/83/99)		LI20 (GF10) (9/0/83/95)
1	2.2m	700	300	11.7	2.3:1	•••	•••2)	•••	•••	•••	•••	•••2)
2	"	700	400	11.7	1.8:1	•••	•••2)	•••	•••	•••	•••	•••
3	"	700	300	20	2.3:1	••	••2)	••	••2)	••	••	
4	"	700	400	20	1.8:1	••	••2)	••	••	••	••	

1) Fifty four PSP's established in 1990.

Data available: RO1897: Height and diameter annually from 1990 – 2000, then every two years.

2) Twelve additional PSP's were established in 1991: ten in GF14, one in GF17 seedlings, and one in the GF17 cuttings.

Data available: RO1897: height and diameter annually from 1991 – 2000, then every two years.

3) Four additional types of planting stock are included in this experiment but are not being monitored with PSP's. They are:

GF7(LI27)	Bulked '870' crosses, 9/0/83/98 (10 reps)
GF7	1 year old cuttings from Kaingaroo climbing select seedlings in FRI nursery (2 reps)
GF16 (approx.)	1 year old cuttings from "880" seedlings in FRI nursery (2 reps)
GF16	Cuttings from 4 yr old trees in "875" diallel progeny tests at Kaingaroo Cpt 327 and Onepu (10 reps)

4) First thinning (treatments 1 & 2) carried out in March 1993.

Late thinning (treatments 3 & 4) carried out in January 1998.

APPENDIX 10

Experimental design for randomised incomplete block Silviculture/Breed Trials planted in 1987 at Woodhill (FR7).
Each dot represents one large plot with a PSP. 1)

Silviculture					Planting stock					
Trt	Pruning	Stocking (stems/ha)		Thinning 2)		Seedlings				
		Initial	Final	MCH (m)	Ratio	GF7 (FR179/2320)	GF14 (3/3/85/1)	GF19 (2/6/86/29)	GF21 (6/3/86/46)	LI28(GF13) (9/3/86/166)
1	4m	500	100	6.2	5:1	••	••		••	••
2	"	500	200	6.2	2.5:1	••	••		••	••
3	"	1000	400	6.2	2.5:1	••	••		••	••
4	"	1500	600	6.2	2.5:1	••	••		••	••
5	Unpruned	500	500	-	1:1	••	••		••	••
6	4m	500	200	20	2.5:1	••	••		••	••
Additional at Woodhill (FR7):										
7	Best 250 s/ha	800	250	6.2	3.2:1			•		
7	Best 320 s/ha	800	320	6.2	2.5:1			•		
8	Best 250 s/ha	1000	250	6.2	4:1			•		
8	Best 320 s/ha	1000	320	6.2	3.1:1			•		
9	Best 250 s/ha	1200	250	6.2	4.8:1			•		
9	Best 320 s/ha	1200	320	6.2	3.75:1			•		

1) Fifty four PSP's established and thinned where applicable in December 1992.

Data available: FR7: Heights only, age 2, pruning measurements 1992, height and diameter annually from 1993-1998, 2000-2003, then every two years.

2) Late thinning (treatment 6) carried out in September 2000.

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 32.

APPENDIX 11

Experimental design for randomised incomplete block Silviculture/Breed Trials planted in 1987 at Tahorakuri (FR8).
Each dot represents one large plot with a PSP.¹⁾

Silviculture										Planting stock			
Trt	Pruning		Stocking (stems/ha)			Thinning			Seedlings				
	1st Gauge prune	2nd 2) Crown remaining	Initial	Interim	Final	1st MCH (m)	2nd MCH (m)	Ratio	GF7 (FRI79/2320)	GF14 (3/3/85/1)	GF21 (Best 16 "268" series - NZFP)	GF21 (6/3/86/46)	LJ28(GF13) (9/3/86/166)
1	10cm	4m	500	-	1006)	6.2		5:1	▲▲	▲▲		▲▲	▲▲
2	"	"	500	-	200	6.2		2.5:1	●●	●●		●●	●●
3	"	"	1000	-	400	6.2		2.5:1	●●	●		●●	●●
3a	"	"	1000	500 ³⁾	400	4.5	6.2	2.5:1		●			
4	"	"	1500	-	600	6.2		2.5:1	●	●●		●●	●●
4a	"	"	1500	400 ³⁾	400	4.5		3.75:1	●				
5	Unpruned	Unpruned	500	-	500	-		1:1	●●	●		●●	●●
5a	"	4m	500	-	500					●			
6	10cm	4m	500	-	200	6.2 ⁴⁾		2.5:1	●●	●●		●●	●●
<u>Additional plots with local seedlot 5)</u>													
7	None		1000	-	1000	-		1:1			▲▲▲		
8	2.2m, 4.2m, 6m		1000	-	400	20		2.7:1			▲▲▲		

1) Fifty four PSP's established and thinned where applicable in March 1992.

Data available: FR7: Heights only, age 2, pruning measurements 1992, height and diameter annually from 1993-1998, 2000-2003, then every two years.

2) An unscheduled 2nd prune was carried out by local staff at 9.0m MCH in October 1993.

3) An unscheduled interim thinning was carried out by local staff during the regeneration cutting operation in 1991.

4) Treatment 6 was originally a production thin (at 20m MCH) but was thinned in error at plot establishment, now equivalent to treatment 2.

5) Plots abandoned (▲) in 2000, local treatments not carried out and now too costly to measure.

6) Plots abandoned (▲) in 2001, due to extreme undergrowth, poor form and measurement difficulty (treatment not suitable for analysis).

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 32.

APPENDIX 12

Experimental design for randomised incomplete block Silviculture/Breed Trials planted in 1987 at Kaingaroa Cpt 481 (FR9).
Each dot represents one large plot with a PSP. 1)

Trt	Silviculture				Planting stock				
	Pruning	Stocking (stems/ha)		Thinning ²⁾		Seedlings			
		Initial	Final	MCH (m)	Ratio	GF7 (FR179/2320)	GF14 (3/3/85/1)	GF21 (6/3/86/46)	LJ28(GF13) (9/3/86/166)
1	Crown remaining	250	100	6.2	2.5:1	••	••	••	••
2	"	500	200	6.2	2.5:1	••	••	••	••
3	"	1000	400	6.2	2.5:1	••	••	••	••
4	"	1500	600	6.2	2.5:1	••	••	••	••
5	Unpruned	500	500	-	1:1	••	••	••	••
6	4m	500	200	20	2.5:1	••	••	••	••

1) Forty eight PSP's established and thinned where applicable in March 1994.

Data available: FR9: Heights only, age 2, pruning measurements 1994, height and diameter annually from 1994 – 1998, then every two years.

2) Late thinning (treatment 6) to be completed in 2001/2002.

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 32.

APPENDIX 13

Experimental design for randomised incomplete block Silviculture/Breed Trials planted in 1987 at Glengarry (FR10).
Each dot represents one large plot with a PSP. ¹⁾

Silviculture							Planting stock					
Trt	Pruning	Stocking (stems/ha)			Thinning		Seedlings					
		Initial	Interim	Final	1st MCH (m)	2nd MCH (m)	Ratio	GF7 (FRI7/9/2320)	GF14 (3/3/85/1)	GF16 (2/6/86/27)	GF21 (6/3/86/46)	LI28(GF13) (9/3/86/166)
1	10 cm	500	-	100	6.2	-	5:1	••	••			••
2	"	500	-	200	6.2	-	2.5:1	••	••			••
3	"	1000	-	400	6.2	-	2.5:1	••	••			••
4	"	1500	-	600	6.2	-	2.5:1	••	••			••
5	Unpruned	500	-	500	-	-	1:1	••	••			••
6	10 cm	500	-	200	6.2 ²⁾	-	2.5:1	••	••			••
<u>Additional plots with local seedlot ³⁾:</u>												
7	2.2m, 4.2m	500	-	200	20	-	2.5:1			•••		
8	2.2m, 4.2m, 6m	1000	300	200	18	28	5:1			•••		

1) Fifty four PSP's established and thinned where applicable in February 1992.

Data available: FR10: Heights only, age 2, pruning measurements 1992, height and diameter annually from 1992 – 1998, then every two years.

2) Treatment 6 was originally a production thin (at 20m MCH) but was thinned in error at plot establishment, now equivalent to treatment 2.

3) Treatments have not been carried out in additional plots (still unthinned and pruned to 4m)

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 32.

APPENDIX 14

Experimental design for randomised incomplete block Silviculture/Breed Trials planted in 1987 at Ditchlings (FR11).

Each dot represents one large plot with a PSP. 1) 2)

Silviculture					Planting stock				
Trt	Pruning	Stocking (stems/ha)		Thinning 3)		Seedlings			
		Initial	Final	MCH (m)	Ratio	GF7 (FR179/2320)	GF14 (3/3/85/1)	GF21 (6/3/86/46)	L128(GF13) (9/3/86/166)
1	4m	250	100	6.2	2.5:1	●▲	●●	●●	●●
2	"	500	200	6.2	2.5:1	●●	●●	●●	●▲
3	"	1000	400	6.2	2.5:1	●●	●●	●●	●●
4	"	1500	600	6.2	2.5:1	●●	●●	●▲	●●
5	Unpruned	500	500	-	1:1	●●	●●	●●	●●
6	4m	500	200	20	2.5:1	●●	●●	●●	●●

1) Forty eight PSP's established and thinned where applicable in January 1993.

Data available: FR11: Heights only, age 2, pruning measurements 1993, height and diameter annually from 1993 – 1998, then every two years.

▲ Plots abandoned in 1994/95 due to wind damage and mortality problems in two plots; trees close to power lines felled in other plot

2) Row plots of each stock type were established adjacent to the large block trial.

3) Late thinning (treatment 6) to be completed in 2001/2002.

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 32.

APPENDIX 15

Experimental design for randomised incomplete block Silviculture/Breed Trials planted in 1987 at Otago Coast (FR12).
Each dot represents one large plot with a PSP 1).

Trt	Silviculture				Planting stock			
	Pruning	Stocking (stems/ha)		Thinning ²⁾	Seedlings			
	Crown remaining	Initial	Final		GF7 (FR179/2320)	GF14 (3/3/85/1)	GF21 (6/3/86/46)	LJ28(GF13) (9/3/86/166)
1	4m	250	100	6.2	2.5:1	▲▲	▲▲	▲▲
2	"	500	200	6.2	2.5:1	●●	●●	●●
3	"	1000	400	6.2	2.5:1	●●	●●	●●
4	"	1500	600	6.2	2.5:1	●●	●●	●●
5	Unpruned	500	500	-	1:1	●▲	●●	●●
6	4m	500	200	20	2.5:1	●●	●●	●●

1) Forty seven PSP's established and thinned where applicable in March 1994.

Data available: FR12: Heights only age 2 years, pruning measurements 1994, height and diameter annually from 1994 – 1998, then every two years.

▲ Plot in GF13 seedlot not established, unable to distinguish plot trees; plot in GF7 seedlot , trt 5, was abandoned in 1997 due to severe wind damage. Plots abandoned in trt 1, due to extreme undergrowth, poor form, loss of trees and measurement difficulty (treatment not suitable for analysis).

2) Late thinning (treatment 6) is scheduled for 2002/2003.

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 32.

APPENDIX 16

Experimental design for randomised incomplete block Silviculture/Breed Trials planted in 1988 at Mamaranui (FR54).
Each dot represents one large plot with a PSP.¹⁾

Silviculture					Planting stock				
Trt	Pruning	Stocking (stems/ha)		Thinning ³⁾		Seedlings		Cuttings	
		Initial	Final	MCH (m)	Ratio	GF14 (3/3/87/1)	GF22 (6/6/87/21)		L123 (GF9) (9/3/86/170)
1	4m	250	100	6.2	2.5:1	••	••	••	
2	"	500	200	6.2	2.5:1	••	••	••	••
3	"	1000	400	6.2	2.5:1	••	••	••	••
4	"	1500 2)	600	6.2	2.5:1	••	••	••	
5	Unpruned	500	500	-	1:1	••	••	••	
6	4m	500	200	20	2.5:1	••	••	••	
7	"	200	200	-	1:1				••

- Forty two PSP's established and thinned where applicable in October 1992.
Data available: FR54: Heights only, age 2, pruning measurements 1992, height and diameter annually from 1992 – 2002, then every two years.
 - Initial planting actually 1555 stems/ha. An extra row of trees was included in the buffer (ie. a three row buffer).
 - Late thinning (treatment 6) was carried out in January 2000.
- PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 46.

APPENDIX 17

Experimental design for randomised complete block **Silviculture/Breed Trials** planted in 1988 at Eyrewell (FR55).
Each dot represents one large plot with a PSP.1)

Silviculture					Planting stock				
Treatment		Pruning	Stocking (stems/ha)		Thinning		Seedlings		Cuttings
Original	Estab ²⁾	Crown remaining	Initial	Final	MCH (m)	Ratio	GF16 (2/3/87/34)	GF22 (6/6/87/21)	GF17 (9/0/83/96)
1	1	4m	250	100	6.2	2.5:1		●●	
2 & 6	2	"	500	200	6.2	2.5:1		●●	●●
3 & 7	3	"	1000	400	6.2	2.5:1		●●	●●
5	4	Unpruned	500	500	6.2	1:1		●●	
4	5	4m	1200	600	6.2	2:1		●●	
10	6	"	550	275	6.2	2:1	●●		
11	7	"	830	300	6.2	2.8:1	●●		
8	8	"	200	200	-	1:1			●●
9	9	"	275	275	-	1:1	●●		

1) Twenty two PSP's established and thinned where applicable in December 1994.

Data available: FR55: Heights only, age 2, pruning measurements 1994, height and diameter annually from 1995 – 1999, then every two years.

2) Original treatment numbers were reallocated, December 1994, to a more logical sequence for establishing and numbering of PSP plots.

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 46.

APPENDIX 18

Experimental design for randomised incomplete block Silviculture/Breed Trials planted in 1988 at Dalethorpe (FR56).
Each dot represents one large plot with a PSP.¹⁾

Silviculture					Planting stock				
Trt	Pruning	Stocking (stems/ha)		Thinning ³⁾		Seedlings			Cuttings
		Initial	Final	MCH (m)	Ratio	GF14 (3/3/87/1)	GF22 (6/6/87/21)	LI23 (GF9) (9/3/86/170)	GF17 (9/0/83/96)
1	4m	250	100	6.2	2.5:1	●●	●▲	●●	
2	"	500	200	6.2	2.5:1	●●	●▲	●●	●▲
3	"	1000	400	6.2	2.5:1	●●	●●	●▲	▲▲
4	"	1500 2)	600	6.2	2.5:1	●●	●●	●▲	
5	Unpruned	500	500	-	1:1	●●	●●	●●	
6	4m	500	200	20	2.5:1	●●	●●	●●	
7	"	200	200	-	1:1				●▲

1) Thirty nine PSP's established and thinned where applicable in March 1995.

Data available: FR56: Heights only, age 2, pruning measurements 1992, height and diameter annually from 1995 – 1999, then every two years.

▲ Three plots not established due to poor tree quality and mortality, five plots abandoned in 2001 due to wind damage.

2) Initial planting actually 1555 stems/ha. The extra row of trees was included in the buffer (ie. a three row buffer).

3) Late thinning (treatment 6) is scheduled for 2003/04.

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 46.

APPENDIX 19

Experimental design for split plot Silviculture/Breed Trial planted in 1988 at Tikokino (FR57).
Each dot represents one large plot with a PSP.1)

Trt	Silviculture				Planting stock			
	Pruning	Stocking (stems/ha)		Thinning ²⁾		Seedlings		Cuttings
		Crown remaining	Initial	Final	MCH (m)	Ratio	GF19 (2/6/87/35)	
1	4m	250	100	6.2	2.5:1	●●	●●	●●
2	"	500	200	6.2	2.5:1	●●	●●	●●
3	"	1000	400	6.2	2.5:1	●●	●●	●●
4	"	1500	600	6.2	2.5:1	●●	●●	●●
5	"	500	200	20	2.5:1	●●	●●	●●
6	Unpruned	600	600	-	1:1	●●	●●	●▲
7	"	400	400	-	1:1	●●	●●	●▲

1) Forty PSP's established and thinned where applicable in December 1993.

Data available: FR57: Heights only age 2 years, pruning measurements 1993, height and diameter annually from 1994 – 1999, then every two years.

▲ Plots not established due to high mortality.

2) Late thinning (treatment 5) is scheduled for 2001/02.

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 46.

APPENDIX 20

Experimental design for split-plot Silviculture/Breed Trial planted in 1989 at Tikokino (FR77).

Each dot represents one large plot with a PSP.¹⁾

Silviculture				Planting stock 2)			
Trt	Pruning	Stocking (stems/ha)		Thinning ⁴⁾		Seedlings	
	Crown remaining	Initial	Final	MCH (m)	Ratio	Nursery bed	Cuttings
						Nursery bed	Root-trainer ³⁾
						GF2 (88/101) US	GF25 (88/1) RS
						GF16 (88/6) OS	GF23 (88/2) OC
							GF25 (88/1) RC
							DFC
							Directly planted field cuttings
1	Unpruned	500	500	-	1:1	•	•
2	4m	500	200	6.2	2.5:1	••	••
3	"	500	200	20	2.5:1	•	•
4	"	500	400	6.2	1.25:1	••	••

1) Thirty five PSP's established and thinned where applicable in November 1994.

Data available: FR77: Heights only, age 2, pruning measurements 1994, height and diameter annually from 1995 – 1999, then every two years.

▲ Plot not established, unable to locate plot trees.

2) Row plots of each stock type were established adjacent to large block trials.

3) Summer planting (April 1989) of these seedlots.

4) Late thinning (treatment 3) is scheduled for 2002/03.

Seedlot codes: US = unimproved seedling OS = open grown seedling OC = open grown cutting
RS = root trainer seedling RC = root trainer cutting

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 71.

APPENDIX 21

Experimental design for split plot Silviculture/Breed Trial planted in 1989 at Gwavas (FR78).
Each dot represents one large plot with a PSP.¹⁾

Silviculture					Planting stock 2)						
Trt	Pruning	Stocking (stems/ha)		Thinning ³⁾		Seedlings		Cuttings			
		Initial	Final	MCH (m)	Ratio	Nursery bed	Root-trainer ⁴⁾	Nursery bed	Root-trainer ⁴⁾	Directly planted field cuttings	
	Crown remaining					GF2 (88/101) US	GF16 (88/6) OS	GF25 (88/1) RS	GF23 (88/2) OC	GF25 (88/1) RC	DFC
1	Unpruned	500	500	-	1:1	●	● ⁵⁾	▲	● ⁵⁾	●	▲
2	4m	500	200	6.2	2.5:1	●●	●●	▲▲	●●	●●	▲▲
3	"	500	200	20	2.5:1	●	●	▲	●	●	▲
4	"	500	400	6.2	1.25:1	●●	●●	▲▲	●●	●●	▲▲

1) Twenty four PSP's established and thinned where applicable in January 1995.

Data available: FR78: Heights only, age 2, pruning measurements 1995, height and diameter annually from 1995 – 1999, then every two years.

▲ No plots established in these seedlots due to high mortality.

2) Row plots of each stock type were established adjacent to large block trials.

3) Late thinning (treatment 3) is scheduled for 2002/03.

4) Summer planting (April 1989) of these seedlots, very low survival.

5) Two plots accidentally pruned, now equivalent to treatment 4 (mortality resulted in the final crop stocking of 400 stems/ha)

Seedlot codes: US = unimproved seedling OS = open grown seedling OC = open grown cutting

RS = root trainer seedling RC = root trainer cutting

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 71.

APPENDIX 22

Experimental design for completely randomised **Silviculture/Breed Trial** planted in **1989** at **Kawerau (FR84)**.

Each dot represents one large plot with a PSP. 1)

Silviculture					Planting stock ²⁾				
Trt	Pruning	Stocking (stems/ha)		Thinning ³⁾		Seedlings		Cuttings	
		Initial	Final	MCH (m)	Ratio	GF2 (88/101)	GF16 (88/6)		GF25 (38/1)
1	4m	600	250	6.2	2.4:1	•••	•••	•••	•••
2	4m	600	250	20	2.4:1	•••	•••	•••	•••
3	Unpruned	600	600	-	1:1	•	•	• ⁴⁾	•
4	4m	600	600	-	1:1	••	••	••	••

- 1) Thirty six PSP's established and thinned where applicable in November 1993. Buffers are 2.75m surrounding each plot, that is, 5.5m between plots.
- Data available: FR84:** Heights only, age 2, pruning measurements 1993, height and diameter annually from 1994 – 2001, then every two years.
- 2) Row plots of each stock type were established adjacent to the large block trial.
- 3) Late thinning (treatment 2) was carried out in September 1998.
- 4) Plot was pruned after plot establishment, now equivalent to treatment 4.
- 5) PF Olsen registered seedlot, GF estimated only.

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 71.

APPENDIX 23

Experimental design for split plot **Silviculture/Breed Trial** planted in **1989** at **Kaingaroo**, Cpt 1187 (**FR85**).
Each dot represents one large plot with a PSP. 1)

Silviculture					Planting stock							
Trt	Pruning	Stocking (stems/ha)		Thinning ²⁾		Seedlings				Cuttings		
		Initial	Final	MCH (m)	Ratio	GF2 (88/101)	GF16 (88/6)	GF18 (88/7)	GF23 (88/2)	GF25 (88/4)	GF22 (6/6/87/21)	GF25 (6/6/87/20)
1	4m	833	250	6.2	3.3:1	••	••	••	••	••	••	••
2	4m	833	250	20	3.3:1	••	••	••	••	••	••	••
3	Unpruned	667	667	-	1:1	••	••	••	••	••	••	••

1) Forty two PSP's established and thinned where applicable in January 1994.

Data available: FR85: Heights only, age 2, pruning measurements 1994, height and diameter annually from 1994 – 1999, annually 2001 – 2003, then every two years.

2) Late thinning (treatment 2) was carried out in April 2001.

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 71.

APPENDIX 24

Experimental design for Silviculture/Breed Trial planted in 1989 at Golden Downs (FR86).
Each dot represents one large plot with a PSP.¹⁾

Trt	Silviculture				Planting stock				
	Pruning	Stocking (stems/ha)		Thinning		Seedlings			
		Initial	Final	MCH (m)	Ratio	GF2 (88/101)	GF16 (88/6)	GF23 (88/2)	LI27(GF6) (88/868)
	Crown remaining								
1	4m	667	250	6.2	2.5:1	••	••	••	••
2	Unpruned	667	667	-	1:1	•	•	•	• ²⁾
3	4m	667	667	-	1:1	•	•	•	•

1) Sixteen PSP's established and thinned where applicable in February 1995.

Data available: FR86: Heights only, age 2, pruning measurements 1995, height and diameter annually from 1995 – 1999, then every two years.

2) An unscheduled low prune was carried out by local staff, plot is now equivalent to treatment 3.

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 71.

APPENDIX 25

Experimental design for unbalanced split-split block Silviculture/Breed Trials planted in 1990 at **Tungrove (FR121/1)** and **Tarawera (FR121/6)**.

Each dot represents one large plot with a PSP.¹⁾

Silviculture							Planting stock				
Trt	Pruning	Stocking (stems/ha)		Thinning		GF7 (FR179/2320)	Seedlings				
		Initial	Final	MCH (m)	Ratio		GF14 (88/105)	GF16 (88/201)	GF25 (89/708)	LI25 (GF13) (89/15)	
1	4m	250	100	6.2	2.5:1	●▲			●▲	●▲	
2	"	500	200	6.2	2.5:1	●	●		●	●	
3	"	1000	400	6.2	2.5:1	●			●	●	
4	Unpruned	500	200	6.2	2.5:1	●			●	●	
5	"	1000	400	6.2	2.5:1	●			●	●	
6	"	1000	600	6.2	1.7:1	●			●	●	
7	"	1000	1000	-	1:1	●		●	●	●	

- 1) Twenty five PSP's (with a buffer receiving the same treatment as the inner PSP) established and thinned where applicable at Tarawera in March 1995 and at Tungrove in September 1995.

Data available: FR121/6: Heights only, age 2, pruning measurements 1995, height and diameter annually from 1995 – 1999, then every two years.

FR121/1: Heights only, age 2, pruning measurements 1995, height and diameter annually from 1996 – 1999, then every two years.

- ▲ Plots abandoned in 2001, at Tungrove site only, due to extreme undergrowth, poor form and measurement difficulty (treatment not suitable for analysis).

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 83.

APPENDIX 26

Experimental design for unbalanced split-split block Silviculture/Breed Trial planted in 1990 at Atiamuri (FR121/2).
Each dot represents one large plot with a PSP.1)

Silviculture					Planting stock					
Trt	Pruning	Stocking (stems/ha)		Thinning		Seedlings				
		Initial	Final	MCH (m)	Ratio	GF7 (FR179/2320)	GF14 (88/105)	GF16 (88/201)	GF25 (89/708)	LJ25 (GF13) (89/15)
1	4m	250	100	6.2	2.5:1	▲	▲	▲	▲	▲
2	"	500	200	6.2	2.5:1	●	●	●	●	●
3	"	1000	400	6.2	2.5:1	●			●	●
4	Unpruned	500	200	6.2	2.5:1	● ²⁾			●	●
5	"	1000	400	6.2	2.5:1	●			●	●
6	"	1000	600	6.2	1.7:1	●			●	●
7	"	1000	1000	-	1:1	●	●	●	●	●
8	"	722	300	6.2	2.4:1	●	●	●	●	●

1) Thirty two PSP's (with a buffer receiving the same treatment as the inner PSP) established and thinned where applicable in February 1995.
Data available: FR121/2: Heights only, age 2, pruning measurements 1995, height and diameter annually from 1995 – 1999, then every two years.

▲ Plots abandoned in 2001, due to extreme undergrowth, poor form and measurement difficulty (treatment not suitable for analysis).

2) Plot pruned illegally in October 1995 by local staff, now equivalent to treatment 2.

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 83.

APPENDIX 27

Experimental design for unbalanced split-split block **Silviculture/Breed Trial** planted in **1990** at **Gwavas (FR121/3)**.
Each dot represents one large plot with a PSP.¹⁾

Ttr	Silviculture				Planting stock					
	Pruning	Stocking (stems/ha)		Thinning		Seedlings				LI25 (GF13) (89/15)
		Initial	Final	MCH (m)	Ratio	GF7 (FR179/2320)	GF14 (88/105)	GF16 (88/201)	GF25 (89/708)	
	Crown remaining									
1	4m	250	100	6.2	2.5:1	•			•	•
2	"	500	200	6.2	2.5:1	•	•	•	•	•
3	"	1000	400	6.2	2.5:1	•			•	•
4	Unpruned	500	200	6.2	2.5:1	•			•	•
5	"	1000	600	6.2	1.7:1	•			•	•
6	"	1000	1000	-	1:1	•	•	•	•	•

- 1) Twenty two PSP's (with a buffer receiving the same treatment as the inner PSP) established and thinned where applicable in December 1995.
Data available: FR121/3: Heights only, age 2, pruning measurements 1995, height and diameter annually from 1996 – 1999, then every two years.

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 83.

APPENDIX 28

Experimental design for unbalanced split-split block Silviculture/Breed Trials planted in 1990 at Tairua (FR121/4) and Huanui (FR121/7).
Each dot represents one large plot with a PSP. 1)

Trt	Silviculture				Planting stock				
	Pruning	Stocking (stems/ha)		Thinning		Seedlings			
	Crown remaining	Initial	Final	MCH (m)	Ratio	GF7 (FR179/2320)	GF14 (88/105)	GF16 (88/201)	GF25 (89/708)
1	4m	250	100	6.2	2.5:1	•▲			•▲
2	"	500	200	6.2	2.5:1	•	•	•	•
3	"	1000	400	6.2	2.5:1	•			•
4	Unpruned	500	200	6.2	2.5:1	•			•
5	"	1000	400	6.2	2.5:1	•			•
6	"	1000	600	6.2	1.7:1	•			•
7	"	1000	1000	-	1:1	•	•	•	•

1) Eighteen PSP's (with a buffer receiving the same treatment as the inner PSP) established and thinned where applicable at Tairua in October 1994 and at Huanui in November 1994.

Data available: FR121/4; FR121/7: Heights only, age 2, pruning measurements 1994, height and diameter annually from 1995 – 1999, then every two years.

▲ Plots abandoned in 2001, at Tairua site only, due to extreme undergrowth, poor form and measurement difficulty (treatment not suitable for analysis).

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 83.

APPENDIX 29

Experimental design for unbalanced split-split block **Silviculture/Breed Trial** planted in 1990 at Hokonui (FR121/5).

Each ▲ represents one large plot without a PSP.1)

Silviculture					Planting stock					
Trt	Pruning	Stocking (stems/ha)		Thinning		Seedlings				
		Initial	Final	MCH (m)	Ratio	GF7 (FR179/2320)	GF14 (88/105)	GF16 (88/201)	GF25 (89/708)	LI25 (GF13) (89/15)
1	4m	250	100	6.2	2.5:1	▲	▲	▲	▲	▲
2	"	500	200	6.2	2.5:1	▲	▲	▲	▲	▲
3	"	1000	400	6.2	2.5:1	▲			▲	▲
4	Unpruned	500	200	6.2	2.5:1	▲			▲	▲
5	"	1000	400	6.2	2.5:1	▲			▲	▲
6	"	1000	600	6.2	1.7:1	▲			▲	▲
7	"	1000	1000	-	1:1	▲	▲	▲	▲	▲

1) Twenty seven PSP's abandoned at Hokonui in November 1997.

Data available: FR121/5: None.

Trial abandoned, November 1997 - major mortality and gorse problems

APPENDIX 30

Experimental design for unbalanced split-split block Silviculture/Breed Trials planted in 1991 at Mangatu (FR121/8).
Each dot represents one large plot with a PSP. 1)

Silviculture					Planting stock					
Trt	Pruning	Stocking (stems/ha)		Thinning		Seedlings				
		Initial	Final	MCH (m)	Ratio	GF6 (88/102)	GF14 (88/105)	GF16 (88/201)	GF25 (90/294)	LJ25 (GF13) (89/15)
1	4m	250	100	6.2	2.5:1	●			●	●
2	"	500	200	6.2	2.5:1	●	●	●	●	●
3	"	1000	400	6.2	2.5:1	●			●	●
4	Unpruned	500	200	6.2	2.5:1	●			●	●
5	"	1000	400	6.2	2.5:1	▲			●	●
6	"	1000	600	6.2	1.7:1	▲			●	●
7	"	1000	1000	-	1:1	●	●	●	●	●

1) Twenty three PSP's (with a buffer receiving the same treatment as the inner PSP) established and thinned where applicable in January 1996.

Data available: FR121/8: Heights only, age 2, pruning measurements 1996, height and diameter annually from 1996 – 2002, then every two years.

▲ Plots not established due to poor planting, severe regen problem and mortality

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 84.

APPENDIX 31

Experimental design for unbalanced split-split block Silviculture/Breed Trials planted in 1991 at Santoft (FR121/9),
 Shellocks (FR121/11), and Golden Downs (FR121/13).
 Each dot represents one large plot with a PSP.1)

Silviculture					Planting stock					
Trt	Pruning	Stocking (stems/ha)		Thinning		Seedlings				
		Initial	Final	MCH (m)	Ratio	GF6 (88/102)	GF14 (88/105)	GF16 (88/201)	GF25 (90/294)	LI25 (GF13) (89/15)
1	4m	250	100	6.2	2.5:1	•			•	•
2	"	500	200	6.2	2.5:1	•	•	•	•	•
3	"	1000	400	6.2	2.5:1	•			•	•
4	Unpruned	500	200	6.2	2.5:1	•			•	•
5	"	1000	400	6.2	2.5:1	•			•	•
6	"	1000	600	6.2	1.7:1	•			•	•
7	"	1000	1000	-	1:1	•	•	•	•	•

- 1) Twenty five PSP's (with a buffer receiving the same treatment as the inner PSP) established and thinned where applicable at Golden Downs in February 1997, at Santoft in October 1997 and at Shellocks in February 1999.
Data available: FR121/13: Heights only, age 2, pruning measurements 1997, height and diameter annually from 1997 – 2002, then every two years.
 FR121/9: Heights only, age 2, pruning measurements 1997, height and diameter annually from 1998 – 2002, then every two years.
 FR121/11: Heights only, age 2, pruning measurements 1999, height and diameter annually from 1999 – 2002, then every two years.

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 84.

APPENDIX 32

Experimental design for unbalanced split-split block Silviculture/Breed Trials planted in 1991 at Blue Mountains (FR121/10).
Each dot represents one large plot with a PSP.¹⁾

Trt	Pruning	Silviculture			Planting stock				
		Stocking (stems/ha)		Thinning	Seedlings				
		Initial	Final		GF6 (88/102)	GF14 (88/105)	GF16 (88/201)	GF25 (90/294)	LJ25 (GF13) (89/15)
	Crown remaining			MCH (m)	Ratio				
1	4m	250	100	6.2	2.5:1	•		•	▲
2	"	500	200	6.2	2.5:1	▲	•	•	•
3	"	1000	400	6.2	2.5:1	•		•	•
4	Unpruned	500	200	6.2	2.5:1	•		•	▲
5	"	1000	400	6.2	2.5:1	•		•	•
6	"	1000	600	6.2	1.7:1	▲		•	•
7	"	1000	1000	-	1:1	•	•	•	•

1) Twenty PSP's (with a buffer receiving the same treatment as the inner PSP) established at Blue Mountains in March 1999.

Data available: FR121/10: Heights only, age 2, pruning measurements 1999, height and diameter annually from 1999 – 2002, then every two years.

▲ Plots not established due to high mortality.

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 84.

APPENDIX 33

Experimental design for unbalanced split-split block Silviculture/Breed Trials planted in 1991 at Ashley (FR121/12).
Each dot represents one large plot with a PSP. 1)

Silviculture					Planting stock					
Trt	Pruning	Stocking (stems/ha)		Thinning		Seedlings				
		Initial	Final	MCH (m)	Ratio	GF6 (88/102)	GF14 (88/105)	GF16 (88/201)	GF25 (90/294)	LI25 (GF13) (89/15)
1	4m	250	100	6.2	2.5:1	▲			▲	▲
2	"	500	200	6.2	2.5:1	●	●	●	●	●
3	"	1000	400	6.2	2.5:1	●			●	●
4	Unpruned	500	200	6.2	2.5:1	●			●	●
5	"	1000	400	6.2	2.5:1	●			●	●
6	"	1000	600	6.2	1.7:1	●			●	●
7	"	1000	1000	-	1:1	●	●	●	●	●

- 1) Twenty five PSP's (with a buffer receiving the same treatment as the inner PSP) established and thinned where applicable in November 1996.
Data available: FR121/12: Heights only, age 2, pruning measurements 1996, height and diameter annually from 1997 – 2002, then every two years.
 ▲ Plots abandoned in 2001 due to extreme undergrowth, poor form and measurement difficulty (treatment not suitable for analysis).

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 84.

APPENDIX 34

Experimental design for Special-purpose Breed Trials planted in 1992 at Woodhill (FR172/1), Riverhead (FR172/2) ¹⁾, Kaingaroa (FR172/3) and Kinleith (FR172/4)

Each dot represents one large plot with a PSP. ²⁾ ³⁾

Silviculture					Planting stock						
Trt	Pruning	Stocking (stems/ha)		Thinning		Seedlings					
		Initial	Final	MCH (m)	Ratio	GF7 (88/102)	GF14 (88/105)	LI25(GF13) (89/15)	GF184) (91/523)	GF274) (91/296-297)	GF284) (91/294)
1	Unpruned	500	500	-	1:1	●		●●	●●	●●	●●
2	2m	1000	400	10-11	2.5:1		●●	●●●●	●●●●	●●●●	●●●●

1) **FR172/2** at Riverhead Forest was **abandoned** in 1999 due to major gorse problems and subsequent mortality.

2) Twenty five PSP's (with a buffer receiving the same treatment as the inner PSP) established and thinned where applicable at Kaingaroa in November 1999, at Kinleith in December 1999 and at Woodhill in February 2001.

Data available: **FR172/1:** Pruning measurements 2001, height and diameter annually from 2001.

FR172/3: Pruning measurements 1999, height and diameter annually from 2000.

FR172/4: Pruning measurements 1999, height and diameter annually from 2000.

3) Five plots were planted at each site at 250 stems/ha. This treatment was removed from the experimental design in 1999, prior PSP plot establishment.

4) Only a small number of parents have contributed to the seedlot mix, thus less confidence should be placed on the GF rating.

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 101.

APPENDIX 35

Experimental design for Special-purpose Breed Trials planted in 1992 at Takitoo (FR172/5)

Each dot represents one large plot with a PSP.¹⁾

Silviculture				Planting stock							Tissue culture	
Trt	Pruning	Stocking (stems/ha)		Thinning		Seedlings						
	For access	Initial	Final	MCH (m)	Ratio	GF7 (88/102)	GF14 (88/105)	LI25(GF13) (89/15)	GF182) (91/523)	GF272) (91/296-297)	GF282) (91/294)	GF17 (TeTeko)
1a	Unpruned	500	500	-	1:1			•	•	•	•	••
1b	2m	500	500	-	1:1	•	•	•	•	•	•	•
2	2m	1000	400	9	2.5:1		•• ³⁾	•••• ³⁾	•••• ³⁾	•••• ³⁾	•••• ³⁾	•••• ³⁾

- 1) Thirty five PSP's (with a buffer receiving the same treatment as the inner PSP) established and thinned where applicable in February 2000. Five additional plots with a local seedlot and treatment were not established.

Data available: FR172/5: Pruning measurements 2000, height and diameter annually from 2000.

- 2) Only a small number of parents have contributed to the seedlot mix, thus less confidence should be placed on the GF rating
- 3) One plot in each of these seedlots was pruned before plot establishment.

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 101.

APPENDIX 36

Experimental design for Special-purpose Breed Trials planted in 1992 at Otago Coast (FR172/6).

Each dot represents one large plot with a PSP. 1)

Silviculture						Planting stock					
Trt	Pruning	Stocking (stems/ha)		Thinning		Seedlings					
		Initial	Final	MCH (m)	Ratio	GF7 (88/102)	GF14 (88/105)	LJ25(GF13) (89/15)	GF182) (91/523)	GF272) (91/296-297)	GF282) (91/294)
1a	Unpruned	500	500	-	1:1	▲	▲	●	●	●	●▲
1b	2m	500	500	-	1:1			●	●	●	
2	2m	1000	400	9	2.5:1		●●3)	●●●●3)	●●●●3)	●●●●3)	●●●●3)

1) Twenty five PSP's (with a buffer receiving the same treatment as the inner PSP) established at Otago Coast in February 2000.

Data available: FR172/6: Pruning measurements 2000, height and diameter annually from 2000.

▲ Plots not established due to high mortality.

2) Only a small number of parents have contributed to the seedlot mix, thus less confidence should be placed on the GF rating

3) One plot in each of these seedlots was pruned before plot establishment.

PSP establishment and silviculture is documented in Stand Growth Modelling Cooperative Report 101.

APPENDIX 37

Experimental design for Special-purpose Breed Trials planted in 1994 at Kaingaroa (FR215/1)

Each dot represents one large plot with a PSP.1)

Silviculture					Planting stock						
Trt	Pruning	Stocking (stems/ha)		Thinning		Seedlings					
		Initial	Final	MCH (m)	Ratio	GF7 (88/102)	GF14 (3/3/87)	LJ27(GF15) (‘870’ mix)	GF18 (‘875’/’268’)	GF25 (‘875’/’268’)	GF302) (‘850’x’268’)
1	Unpruned	500	500	-	1:1	••	••	••	••	••	••
2	2m	1000	400	7-8	2.5:1	••••	••••	••••	••••	••••	••••

- 1) Thirty six PSP's (with a buffer receiving the same treatment as the inner PSP) established and thinned where applicable in November 1999.
Data available: FR215/1: Pruning measurements 1999, height and diameter annually from 2000

- 2) Only a small number of parents have contributed to the seedlot mix, thus less confidence should be placed on the GF rating

APPENDIX 38

Experimental design for Special-purpose Breed Trials planted in 1994 at Rakautao (FR215/2)

Each dot represents one large plot with a PSP. 1)

Silviculture					Planting stock						
Trt	Pruning	Stocking (stems/ha)		Thinning		Seedlings					
		Initial	Final	MCH (m)	Ratio	GF7 (88/102)	GF14 (3/3/87)	LJ27(GF15) (‘870’ mix)	GF18 (‘875’/‘268’)	GF25 (‘875’/‘268’)	GF302) (‘850’ x ‘268’)
1	Unpruned	500	500	-	1:1	●	●▲	●●	●●	●●	●●
2	2m	1000	400	7-8	2.5:1	●▲	●●●●	●●●●	●●●●	●●●●	●●●●

1) Thirty one PSP’s (with a buffer receiving the same treatment as the inner PSP) established at Rakautao in September 2000.

Data available: FR215/2: Pruning measurements 2000, height and diameter annually from 2001.

▲ Plots not established due to high mortality.

2) Only a small number of parents have contributed to the seedlot mix, thus less confidence should be placed on the GF rating

APPENDIX 39

Experimental design for Special-purpose Breed Trials planted in 1994 at Tokoiti (FR215/3)

Each dot represents one large plot with a PSP.1)

Silviculture						Planting stock					
Trt	Pruning	Stocking (stems/ha)		Thinning		Seedlings					
		Initial	Final	MCH (m)	Ratio	GF7 (88/102)	GF14 (3/3/87)	L127(GF15) (‘870’ mix)	GF18 (‘875’/‘268’)	GF25 (‘875’/‘268’)	GF302) (‘850’ x ‘268’)
1	Unpruned	500	500	-	1:1	•	••	••	••	••	••
2	2m	1000	400	7-8	2.5:1	••	••••	••••	••••	••••	••••

1) Thirty three PSP's (with a buffer receiving the same treatment as the inner PSP) established and thinned where applicable in October 2000.
Data available: FR215/3: Pruning measurements 2000, height and diameter annually from 2001.

2) Only a small number of parents have contributed to the seedlot mix, thus less confidence should be placed on the GF rating