

**SITE PREPARATION TRIAL REVIVAL
A STATUS REPORT**

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Confidential to participants of the NZ Forest Site Management Cooperative

**NZ FOREST SITE MANAGEMENT
COOPERATIVE**

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EXECUTIVE SUMMARY

Old trials that contain mechanical preparation of the soil as a treatment, and are now nearing rotation end, are being evaluated for a final measurement. Investigations to date have found that:

There are 20 trials that are probably suitable and 17 trials that are possibly suitable for remeasurement.

These trials embody at least 118 probable plots and 127 possible plots.

To measure all the probable plots would take about 50 persondays of **Forest Research** time and 34 pdays of Company time.

To measure all the possible plots would take about 45 persondays of **Forest Research** time and 35 pdays of Company time.

The cost for **Forest Research's** involvement would be \$34900 for the probable trials and \$31050 for the possible trials. A saving of about \$6060 could be achieved if the complete programme is instigated, bringing the total cost down from \$65950 to \$59890.

A measurement program could be tailored to any budget that the cooperative sees fit to approve. Further discussions would be needed with company representatives to best gauge the regions/forests on which to spend the money.

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INTRODUCTION

Following the overview report on mechanical site preparation of Smith *et al.* (1996) the proposal 97/7 was accepted and instigated. In the background to the proposal Smith wrote ...“Since many relevant reports were written some years ago, current stand age for some trials may be approaching financial maturity and harvest. It is essential that potentially valuable information not be lost due to failure to re-measure stand growth and development before harvesting occurs.”

METHODS

The search for suitable trials to remeasure was basically a continuation of the approach used by Smith *et al.* i.e. an electronic search, using keywords associated with site preparation, of the **Forest Research** Technical Records system. In this case the registered experiment numbers were produced along with a very short description of each trial. A total of 135 trial sites was identified by this procedure.

From the descriptions it soon became obvious that many trials could be rejected because they were in species other than *P. radiata*, the site preparation did not include mechanical cultivation of the soil itself or there was some other shortcoming in the trial design. The initial list was soon whittled down to 65 trials. Old plot folders containing (hopefully) details of trial designs and suitable maps were then retrieved from the **Forest Research** archives. Questionnaire forms were then sent to forest companies seeking the current status of the stands containing the 65 trials.

After the return of these forms a further assessment of suitability for remeasurement was made. In particular we considered it necessary to be able to measure at least two replicates of any cultivation effect. The replicates could be achieved either through original plot replication or by installing two or more remeasurement plots in a large continuous area of a particular cultivation. Also, it is necessary to have uncultivated areas adjacent to (if not actually in) the trials.

In terms of plot size it is desirable to have at least 15 trees to remeasure and that there is a large (8 -10 metre) treated buffer around the plot. This is in contrast to Euan Mason's report to the Cooperative (Nelson technical session 28 May 1998) but he is measuring current growth increments over a relatively short time span.

RESULTS

In the final sift 20 trials were deemed to probably provide remeasurement opportunities (grade 1) and 17 trials to be possibly useful (grade 2). Using the old Conservancy boundaries the distribution of these trials is given in Table 1.

Table 1: Distribution of "probable" and "possible" trials

<i>Conservancy</i>	<i>Grade 1 Trials</i>	<i>Grade 2 Trials</i>
Auckland	9	1
Rotorua	3	6
Wellington	1	1
Nelson	1	2
Westland	0	0
Canterbury	0	2
Southland	6	5
Total	20	17

Table 2 contains the number of remeasurement plots based solely on the number of plots in the original trial design.

Table 2: Distribution of "probable" and "possible" plots

<i>Conservancy</i>	<i>Grade 1 Plots</i>	<i>Grade 2 Plots</i>
Auckland	69	8
Rotorua	25	42
Wellington	4	9
Nelson	8	7
Westland	0	0
Canterbury	0	13
Southland	12	48
Total	118	127

However in some regions (mainly Southland Grade 1) large areas of a cultivation type offer the opportunity to establish more plots. In fact this approach will be necessary if we are to attain any degree of replication at some sites. More details of the sites can be found in Appendix I.

Proposed Measurement Protocols

Originally we anticipated a MARVL assessment of each plot using a set of standardised parameters applicable to the whole country, plus some others required for the local market by the forest owner. At the Site Management Co-op meeting of 28/5/98 it was suggested by some company representatives that a simple diameter and height measurement and volume calculation would suffice. Such an approach would certainly reduce the time (and cost) of remeasurement but more discussions on this issue are needed.

Time and Associated Costs

All estimated times and associated costs are based on a team of two people from **Forest Research** and two company technicians. It is envisaged that the **Forest Research** people would do most of the locating of individual plots and that the company people would provide most of the expertise for the MARVL assessments.

In Table 3 an estimate of the number of person days required, both from **Forest Research** and In Kind, is provided. It is recognised that if funding were available for the complete exercise, a reduction (by approximately 8 pdays) in the 'Office & Travel' item would be possible. Also, about \$1500 would be saved in operating expenses.

Table 3: Estimated time necessary for remeasurement of plots (pdays)

<i>Conservancy</i>	<i>Grade 1</i>		<i>Grade 2</i>	
	<i>Forest Research</i>	<i>In Kind</i>	<i>Forest Research</i>	<i>In Kind</i>
Auckland	18	18	2	2
Rotorua	6	6	11	11
Wellington	2	2	2	2
Nelson	2	2	3	3
Westland	0	0	0	0
Canterbury	0	0	4	4
Southland	6	6	13	13
Office & Travel	16		10	
Total	50	34	45	35

Table 4 translates the time and associated operating costs into the funding required by **Forest Research** only. All **Forest Research** time has been charged at the rate applicable to workers in the "medium" pay scale for the 1998/99 year (\$2850 per week). Thus there has been a change in costs from the interim verbal presentation at the meeting of 28 May which based the time costs on the old charge rate of \$1925 per week.

Table 4: Estimated **Forest Research** costs

<i>Item</i>	<i>Grade 1</i>	<i>Grade 2</i>
Time	28500	25650
Air travel	1000	1000
Rental vehicle + fuel	2200	2000
Accomm + expenses	3200	2400
Total	\$34900	\$31050

RECOMMENDATIONS

That the Site Management Cooperative Advisory Committee approve the remeasurement of at least the Grade 1 trials.

A measurement program could be tailored to any budget that the cooperative sees fit to approve. Further discussions would be needed with company representatives to best gauge the regions/forests on which to spend the money.

REFERENCES

Smith C.T., Hunter-Smith J.A.C., and Graham J.D. 1996:- A literature review of mechanical site preparation relevant to New Zealand. New Zealand Forest Research Institute, Site Management Cooperative Report 81

APPENDIX I : Probable and possible trial sites							
Status	1=probable, 2=possible						
Suitable plots	u=uncult, w=windrow, r=rip, m=mound, h=rotaryhoe b=bed, v=vblade, sh=shearblade, bn=burn, dc=disc						
Trial #	Forest	Status	Suitable plots	Total	Owner	Mdays on site	
						FRI	Co.
AK522	Waipoua	1	4bn,4(bn+r+h)	8	Nth FM	2	2
AK578/a	Te Kao	1	4bn,4(bn+r+h)	8	CHH	2	2
AK578/b	Te Kao	1	4bn,4(bn+r+h)	8	CHH	2	2
AK578/c	Te Kao	1	3bn,3(bn+r+h)	6	CHH	2	2
AK578/d	Te Kao	1	4bn,4(bn+r+h)	8	CHH	2	2
AK579	Glenbervie	1	4bn,4(bn+r+h)	8	Rayonier	2	2
AK581	Tairua	1	4bn,4(bn+r+h)	8	CHH	2	2
AK645/2	Maramarua	1	2u,5r	7	CHH	2	2
AK662	Whitecliffs	1	4bn,4(bn+r+h)	8		2	2
RO1063	Kaingaroa	1	4bn,4bn+sh+b	8	FCF	2	2
RO1964	Kaingaroa	1	4bn,4r	8	FCF	2	2
RO894	Kaingaroa	1	3r,3w,3b	9	FCF	2	2
WN261/2	Karioi	1	2u,2r	4	WPI	2	2
						26	24
					prep+travel	8	
						34	
NN373	G Downs	1	4u,4r	8	Weyer	2	2
SD401/1	Woodlaw	1	1u,1r	2+	Rayonier	1	1
SD401/2/1	Taringatura	1	1u,1r	2+	Rayonier	1	1
SD401/2/2	Slopedown	1	1u,1r	2+	Rayonier	1	1
SD401/2/3	Hokonui	1	1u,1r	2+	Rayonier	1	1
SD401/4/3	Herbert	1	1u,1r	2+	Res Mge Ltd	1	1
SD401/4/4	Naseby	1	1u,1r	2+	Res Mge Ltd	1	1
						8	8
					prep+travel	8	
						16	
AK479/1	Waipoua	2	2u,2r,2b,2r+b	8	Nth FM	2	2
RO1037/1	Kaingaroa	2	1r+m,1r+b, 1r,1h+r 1 (u,bn,b,r,sh,w, bn+b,bn+r,bn+sh+b ,bn+b+r,bn+sh+ r+b,w+r,sh+r,sh+b,s h+r+b,b+r)	4	FCF	2	2
RO1045	Kaingaroa	2	h+r+b,b+r)	16	FCF	4	4
RO1924	Kaingaroa	2	3bn,5w,5v	13	FCF	3	3
RO1963	Kaingaroa	2	overlay pt R1924		FCF		
RO1984	Kaingaroa	2	?		FCF		
RO1985	Tauhara	2	3v,3v+r,3v+r+m	9	FCF	2	2
WN261/1	Karioi	2	3(screef,v,deepv)	9	WPI	2	2
						15	15
					prep+travel	2	
						17	
CY380	Ashley	2	2lineblade, 2100%blade	4	CHH	2	2
CY469	Selwyn P B	2	3v,3w,3bn	9	SPB	2	2
NN312	G Downs	2	1bn,1dc,1sh	3	Weyer	2	2
NN534	Wairau	2	2u,2r	4	Weyer	1	1
SD401/3	Beaumont	2	3r	3+	Ernslaw	1	1
SD401/4/2	Otago Coast	2	1u,1r,1dc	3	Wenita	1	1
SD444	Berwick	2	3u,6r,3dc	12	Wenita	4	4
SD501	Otago Coast	2	3u,3dc,3r,3r+dc	12	Wenita	3	3
SD542	Berwick	2	3(u,r,v,b,r+b,v+r)	18	Wenita	4	4
						20	20
					prep+travel	8	
						28	