9/91

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Computer Ref: 11690

FOREST RESEARCH INSTITUTE
PROJECT RECORD COVER SHEET

DIVISION: FOREST TECHNOLOGY **PROJECT RECORD NO.:** [3140]

RESEARCH FIELD: PLANTATION MANAGEMENT **EXPT NO.:**

PROJECT NO.: [91]/[92] [301] **WORK PLAN NO.:**
Financial Year Programme Code

AUTHOR: NEIL EGGLESTON **DATE:** 13/3/92

TITLE: COMPARING THE RANGE OF REGIONAL TREE VOLUME AND TAPER TABLES

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KEYWORDS: TREE VOLUME, TAPER

ABSTRACT*

This study compared 47 tree volume and 25 tree taper tables with the aim of providing guidance as to which tables should be used in various situations.

The FRI stand modelling system (STANDPAK) was used to predict the total volumes (using each of the tree volume tables) and the distribution of log grades (using the taper tables) for three standard regimes. In an Auckland example the combined effect of different choices of volume and taper tables resulted in predictions differing by 110 m^3/ha (19%) for total volume and 66 m^3/ha (36%) for pruned log volume.

Tables which would be applicable only to a narrow range of situations were identified. Criteria for selecting tables and a list suggesting combinations of tree volume and taper tables are provided. It was recommended that the 1969 Glenbervie/Whangapoua table no longer be used and that the Woodhill Old Crop tables be used with caution due to behaviour that did not fit the general pattern.

Tables from sand dune forests and the Westland region tended to produce different results to those from the rest of the country, however most of the effects of individual factors such as site and regime were masked by complex interactions. If further recommendations are required as to which would be most appropriate volume and taper tables, these should be based on examination of actual data.

Two projects underway at the time of this study aim to replace the current assortment of regional and individual forest tables with single equations which will account for site and regime variables.

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INTRODUCTION

The tree volume and taper tables available on the FRI modelling system have been developed on a regional and individual forest basis. At the time of the study 47 tree volume and 25 taper tables were generally available for radiata pine.

Table 1: Tree Volume and Taper Tables available on the FRI modelling system as at February 1992

No.	Region	Date
9	Auckland	1952
10	Rotorua	1953
11	Nelson	1952
12	Canterbury	1952
13	Southland	1952
14	All NZ Shelterbelt	1977
29	Karioi	1961
63	Whakarewarewa	1968
65	Hokonui	1969
73	Maramarua, Woodhill, Puhipuhi, Athenree	1975
74	Kauaeranga, Waipoua	1969
75	Glenbervie, Whangapoua	1969
76	Aupouri, Tairua	1969
77	Omahuta, Riverhead	1969
78	Balmoral unthinned	1969
87	Waimea, Nemona, Granville, Tawhai	1969
89	Balmoral thinned	1969
109	Ashley	1971
115	Kaingaroa young crop	1975
116	Kaingaroa old crop	1975
118	Kaingaroa young crop	1975
119	Kaingaroa old crop	1975
126	Otago Coast	1974
128	Esk	1976
134	Gwavas	1976
149	Waitarere	1980
163	Ngaumu	1984
165	Tairua	1981
167	Lake Taupo production thinnings	1982
169	Mohaka	1981
182	All NZ Direct Sawlog	1980
183	Woodhill Old Crop	1982
188	Waiuku	1983
196	Rotoehu	1983
205	Woodhill Old Crop 2nd Thinnings	1983
206	Maramarua 2nd Crop	1984
212	Santoft	1984
214	Mangatu 250-320 stems/ha	1984
218	Mangatu 450 stems/ha	1985
224	Lismore ages 7-22	1985
227	Pomahaka 500 stems/ha age 30 Pukerau Block	1986
230	Golden Downs ages 26-30 Long Gully	1986
231	Te Wera aged 9-31	1986
232	Longwood ages 14-24 Woodlaw Blk	1986
235	Longwood age 30 370 stems/ha	1986
236	Woodhill 370 stems/ha	1986
237	Kaingaroa Transition Crop	1987

Both tree volume and taper equations use diameter at breast height over bark (DBH) and height as the independent variables. The earliest of the tree volume predictions were prepared from hand drawn curves and summarized as tables, whereas more recently, mathematical equations were fitted to the data. In this report the term table and equation are used interchangeably.

A tree volume equation predicts the total stem volume for a given diameter and height. A taper equation can then be applied to the estimate in order to predict how that volume is distributed within the stem.

People using the equations are not always clear about the implications of their choices. The objective of this study was to show what effects the use of different tree volume and taper tables had on predictions and to give guidance as to the best choices.

METHODS

Tree volume and taper equations apply to individual trees, but as stand parameters were considered to be more meaningful, estimates for individual trees were amalgamated so that predictions were in terms of total volume per hectare by log grades.

STANDPAK (Whiteside ID, 1990) was used to simulate the growth of three different regimes: **Direct** (high pruned, 250 stems/ha), **Framing** (unpruned, 400 stems/ha), and **Untended** (1650 stems/ha). See appendix 5 for details of the simulations.

The modelling system predicted the mean DBH and top height for each age, and from distributions about these values, it predicted the values of diameters and heights for individual trees. These diameters and heights were then used as the inputs for the various tree volume and taper equations.

Predictions were made from each of the tree volume equations. STANDPAK was used to simulate growth of the three regimes and to amalgamate the estimates for individual trees into stand volumes.

The comparison of taper tables, was based on input data from one tree volume table. The Kaingaroa Transition Crop tree volume table was used as it was intermediate in terms of treatment history of the stands in the base data and in its predictions of total volume. The various taper tables were compared in terms of their effect on log grade composition.

The regions used in the comparisons were:

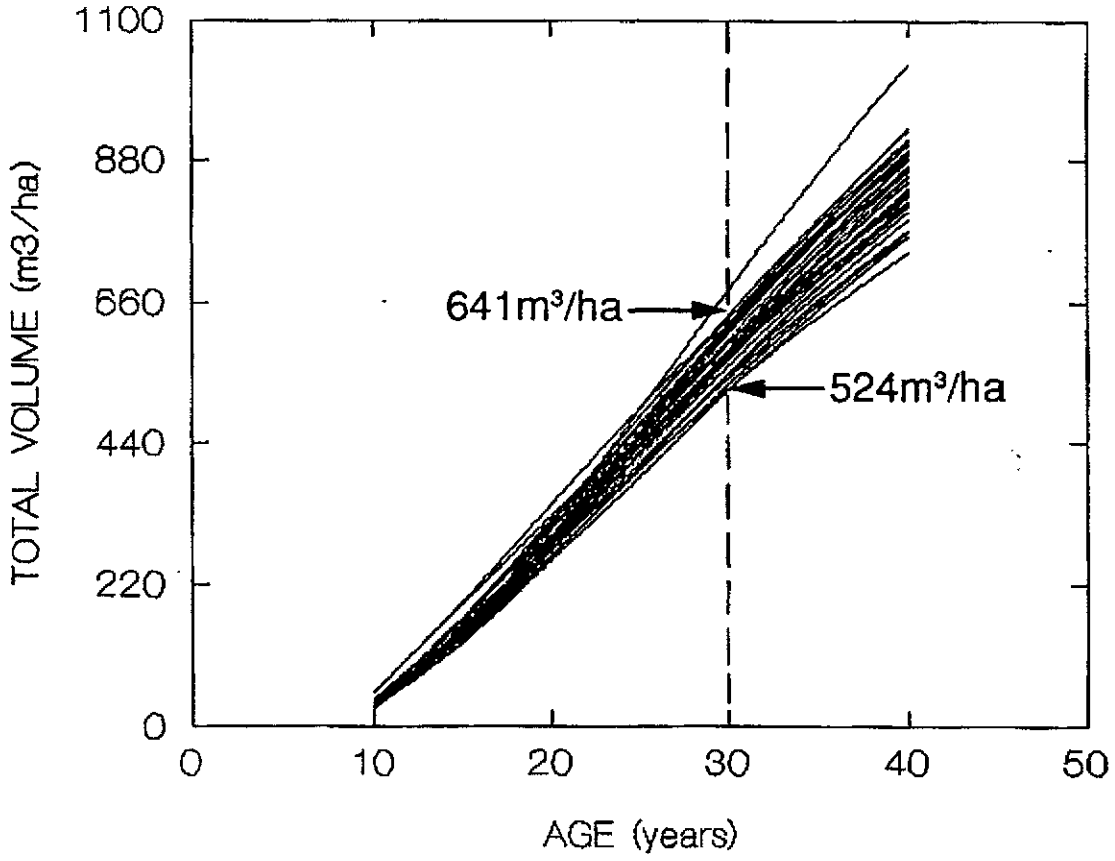
AUCKLAND	(excluding sand dune sites)
ROTORUA	
EAST COAST	
WELLINGTON	(excluding sand dune sites)
SANDS	(Auckland and Wellington areas)
NELSON	
CANTERBURY	
WESTLAND	
SOUTHLAND	

RESULTS

1. TREE VOLUME TABLES

Predictions of total volume from the different tree volume equations were compared by plotting them over age. See figure 1.

Figure 1: Effect of Tree Volume Table on Total Volume



The uppermost curve was the Glenbervie/Whangapoua tree volume table from 1969. It gave results that were very different from all of the others and further investigation cast doubts on its applicability. Disregarding that one, there was still a difference of 109m³/ha between the equation which predicted the greatest basal area at age 30, which was Waiuku 1983 (641m³/ha) and the one which predicted the least, which was Westland 1969 (524m³/ha). The range of 19% between the extremes confirmed that the choice of tree volume equation was indeed important in volume predictions.

Region:
The search for factors that might explain the differences was begun with region, as tables had been developed to apply to regions and then forests. In order to highlight differences between the total volumes predicted by various equations, results were expressed as Mean Annual Increment rather than the cumulative volume shown in figure 1. The Rotorua grouping was used as a basis on which to compare the others, as it had the largest number of tree volume equations. See figure 2.

Figure 2: *Rotorua*

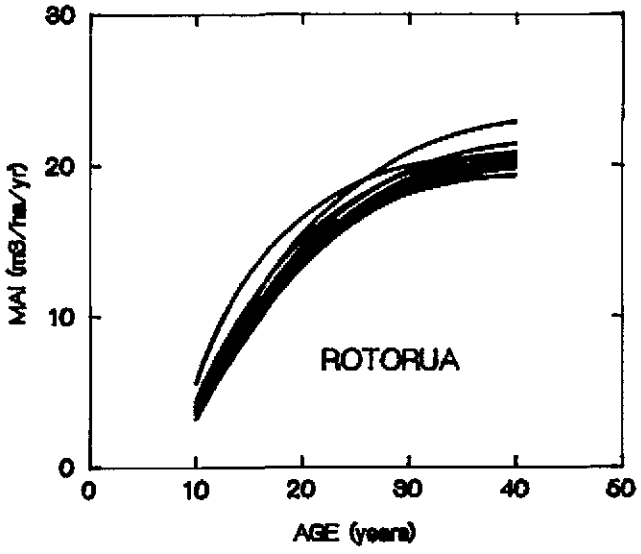


Figure 3: *Auckland compared with Rotorua*

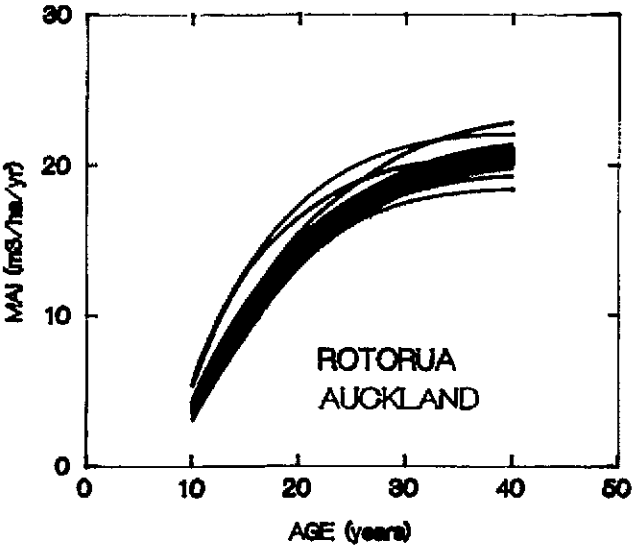
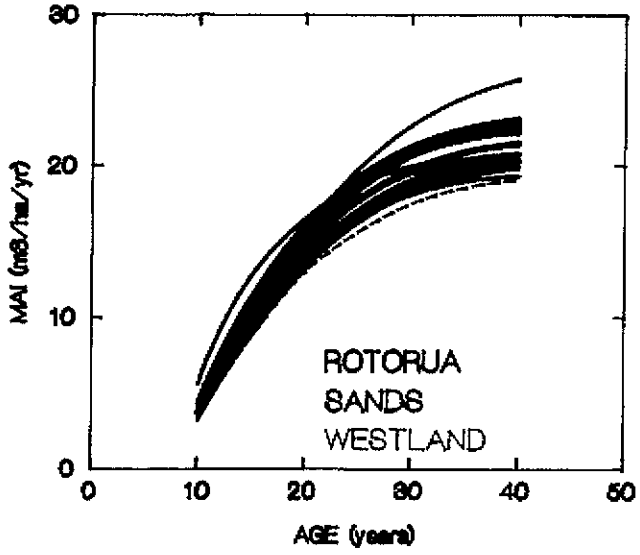


Figure 4: Sands and Westland compared with Rotorua



Only the SANDS and Westland regions seemed to be clearly different from the others. In the rest, the range of results from within each region was similar.

Thinning History:
The tables which had been developed exclusively from stands which were known to be either thinned or unthinned, were grouped. Equations from data sets which consisted of both thinned and unthinned stands, and those where it was not known whether thinning had been carried out or not, were excluded from this comparison. Figure 6 shows results from the Direct Regime and figure 7 for the Untended Regime. Results for the Framing regime were between the two shown below.

Figure 6: Direct Regime

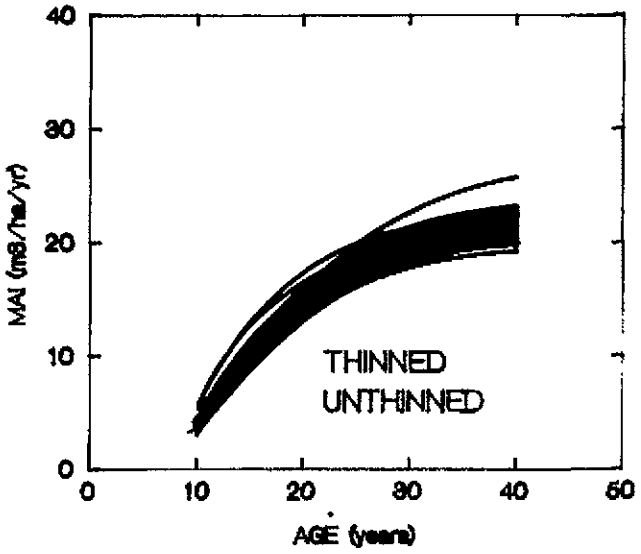
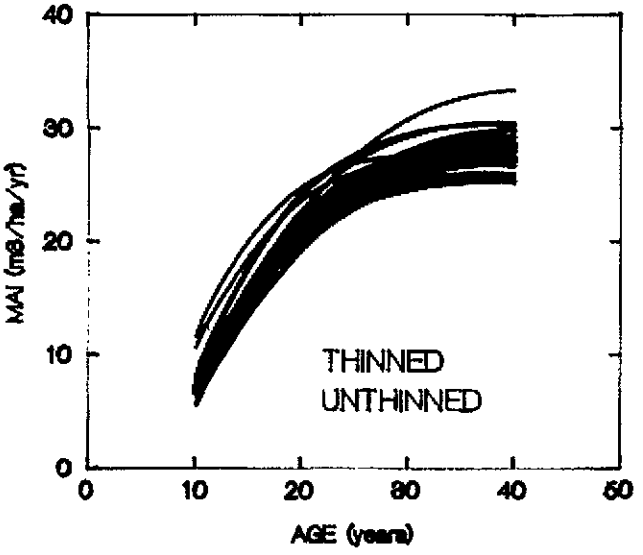


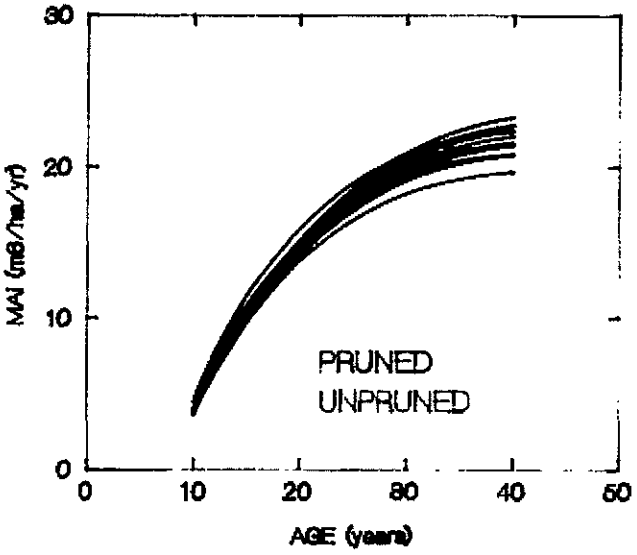
Figure 7: Untended Regime



The tables derived from data collected in unthinned stands tended to predict lower volumes at a given age than those that came from thinned stands, regardless of regime.

Pruning History:
Equations were compared on the basis of pruning history, in the same way that was done for thinning. Only those equations which were based on data that had come from stands that had been either entirely pruned or unpruned were considered. Results from the Direct Regime are shown in figure 8.

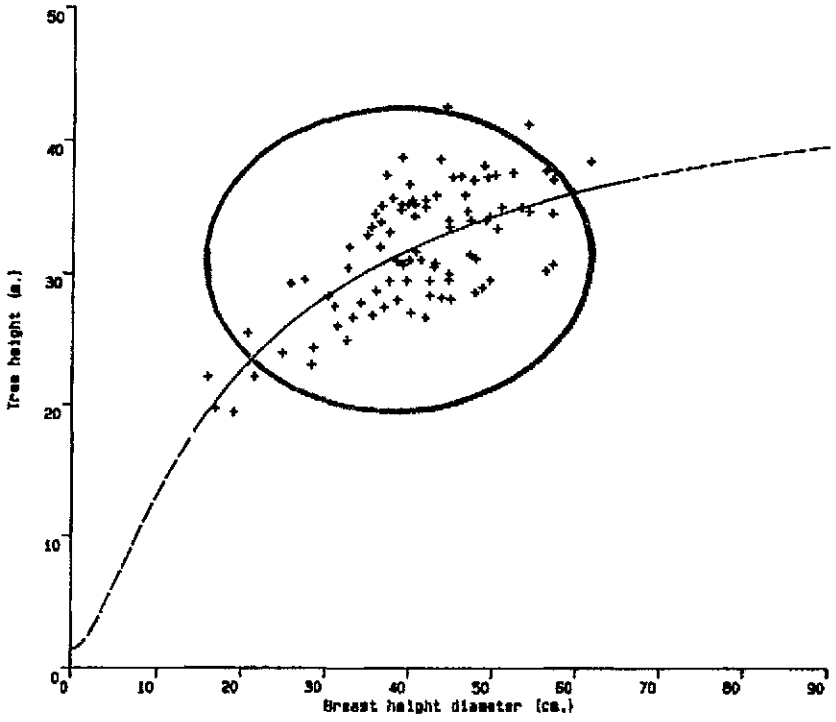
Figure 8: *Pruned compared with Unpruned*



There was no clear difference between predictions from equations developed from pruned vs. unpruned data sets.

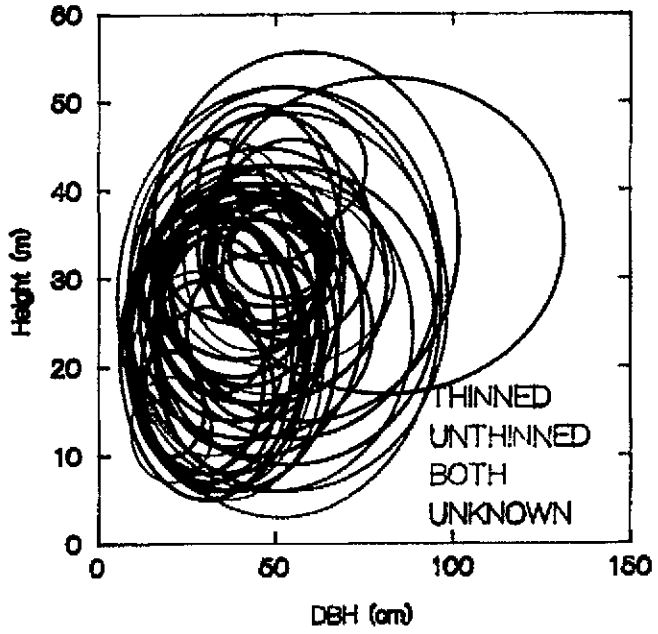
Range of base data:
DBH and height are the variables that the existing tree volume and taper equations use in predicting volume and taper. As it is unwise to use an equation to predict the volume of trees which lie outside the limits of the data set from which the equation was developed, the range of base data was examined for each table. Figure 9 shows the distribution of diameter and height data for a typical tree volume table.

Figure 9: *Diameter/Height relationship for Golden Downs (1986) Tree Volume data set*



The diameter/height pairs in this example follow the typical 'lozenge' shaped distribution, with a few trees of small diameter and height, the majority with a moderate diameter and height, and a few with a greater diameter but of only slightly greater height. Unfortunately, detailed information like this was not available for the older data sets. What had been recorded though, was the minimum and maximum DBH and height for each set. These limits are recorded in the "Table Details" section of STANDPAK (see appendix 1). An ellipse was used to graphically represent the DBH and height limits (see figure 9). Although an ellipse was a somewhat crude approximation of the distribution, it gave a general impression of the range of data. Ranges for all tree volume equations are shown in figure 10.

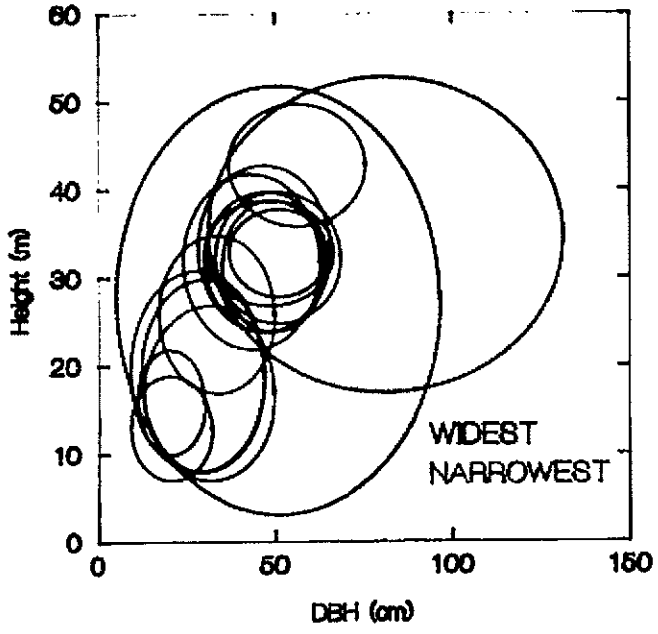
Figure 10: Range of Base Data by Thinning History



There was little difference in the ranges of the thinned vs. the unthinned data sets.

Some equations had been based on narrow ranges of data. Those with the tightest diameter limits were isolated in figure 11.

Figure 11: Narrowest vs. Widest Ranges of Base Data



The 14 equations with the narrowest range of DBHs in the base data were listed in table 2.

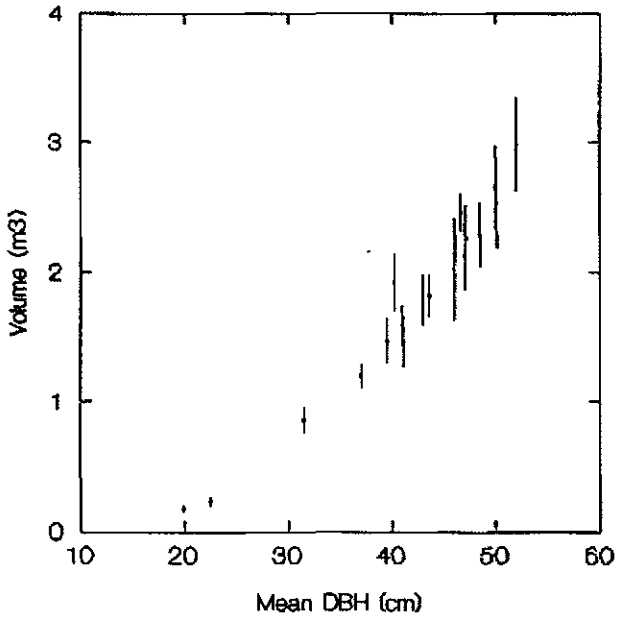
Table 2: Tree Volume Equations Constructed from the Narrowest Ranges of DBH Data

No.	Region	Date	DBH Min.	DBH Max	Height Min.	Height Max.
65	Hokonui	1969	24	63	22	42
87	Waimea, Nemona, Granville, Tawhai	1969	9	47	8	31
89	Balmoral thinned	1969	13	50	7	27
126	Otago Coast	1974	12	47	8	30
167	Lake Taupo production thinnings	1982	11	30	10	22
183	Woodhill Old Crop	1982	33	69	25	40
188	Waiuku	1983	30	65	24	40
196	Rotoehu	1983	37	76	36	50
205	Woodhill Old Crop 2nd Thinnings	1983	17	50	17	35
214	Mangatu 250-320 stems/ha	1984	35	64	24	39
218	Mangatu 450 stems/ha	1985	28	66	24	43
227	Pomahaka 500 stems/ha age 30 Pukerau Block	1986	37	65	28	38
232	Longwood ages 14-24 Woodlaw Blk	1986	9	32	7	19
235	Longwood age 30 370 stems/ha	1986	30	67	27	39

Precision of Individual Tree Volume Estimates:

A tree volume equation gives a single estimate for each combination of DBH and tree height. Figure 12 shows the 95% confidence limits for some of the tables, plotted over the mean DBH for each particular equation. For most data sets there is a 1 in 20 chance of an individual tree's volume differing from the table's estimate by more than 12%.

Figure 12: Precision of Individual Tree Volume Estimates



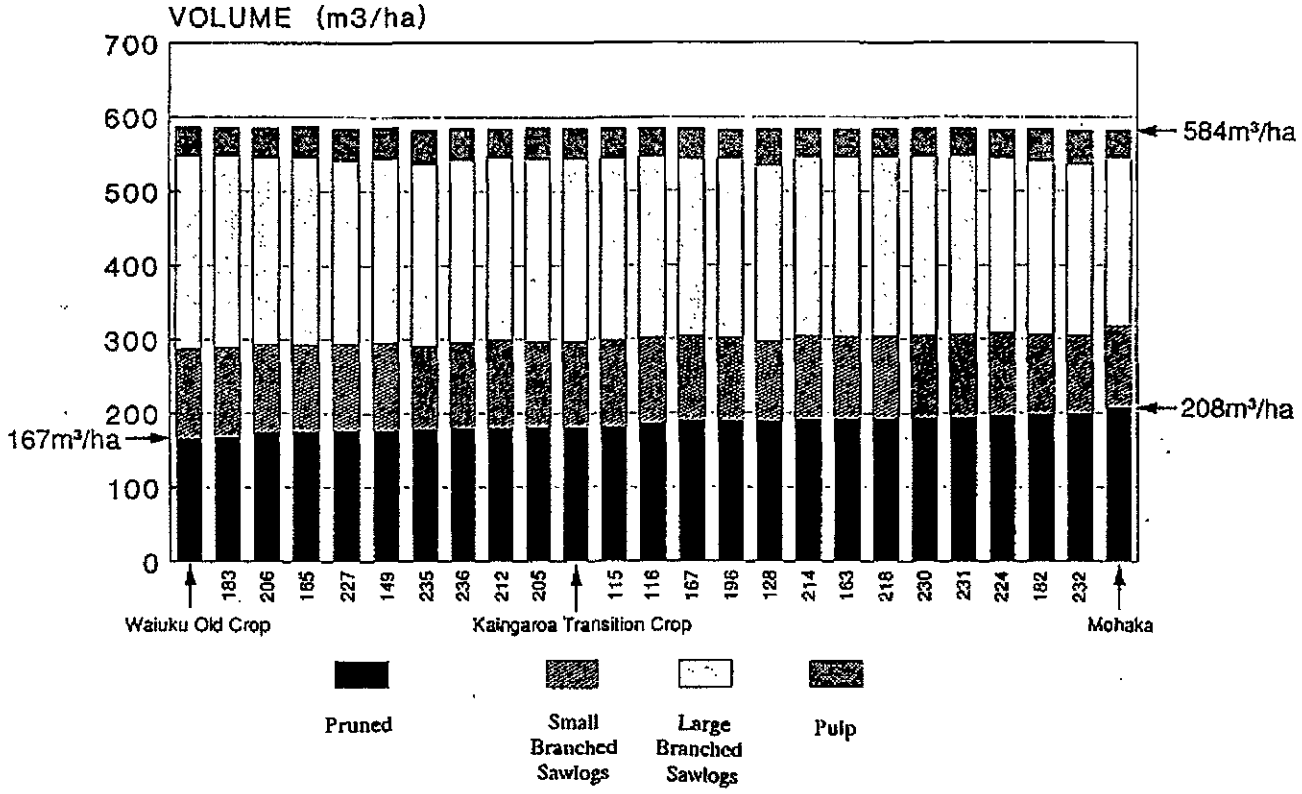
2. TAPER TABLES

The Kaingaroa Transition Crop tree volume table was used as the benchmark against which the other equations were tested. The total volume predicted at age 30 was 585m3/ha. At the same time that the Kaingaroa Transition Crop tree volume equation was derived, an associated taper equation had also been produced. When log making into the FRI log grades ("NZ Domestic" cutting pattern) was simulated in STANDPAK using the Kaingaroa Transition Crop tree volume equation and the associated taper equation, the predicted outturn was:

	m^3/ha	
Pulp	181	31%
Large branched sawlogs	116	20%
Small branched sawlogs	247	42%
Pruned butt logs	41	7%
TOTAL	585	100%

For each of the *taper tables*, a STANDPAK run was made to predict how the estimate of total volume made by the Kaingaroa Transition Crop *tree volume table*, would be allocated into log grades. The results were compared against those predicted by the Kaingaroa Transition Crop taper table. See figure 13.

Figure 13: Effect of Taper Table on Outturn of Log Grades

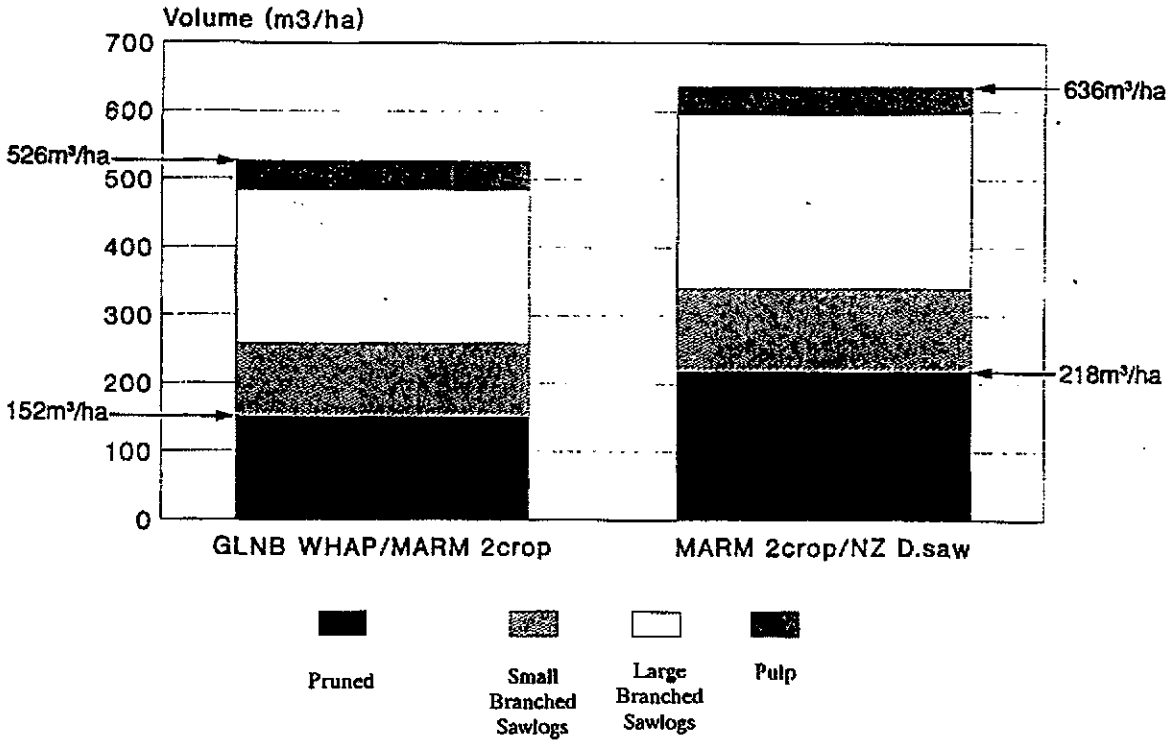


Total volume was constant for all taper tables, as they only alter the allocation of volume within stems, not the estimate of total volume, which is determined by the tree volume table. Choice of taper table had the greatest effect on the proportion of volume in the pruned butt log. There was a 22% difference between the tables that gave the highest and lowest estimates of butt log volume.

3. COMBINATIONS OF VOLUME AND TAPER TABLES

Figures 1 and 13 show that the choice of tree volume tables and of taper tables each had a large effect on predicted outturn. To get an-idea of the overall effect that different combinations of tree volume and taper tables could have, a hypothetical pruned and thinned stand on an Auckland clay site was modelled. In one case the Glenbervie/Whangapoua tree volume table was used in conjunction with the Maramarua second crop taper table. In the other case the Maramarua second crop tree volume table was linked to the NZ direct sawlog taper table. Figure 14 illustrates the effect that these choices had on the prediction of total volume and on how that volume was allocated within the stems.

Figure 14: Volume/Taper Table Combinations



In the first case the total volume was 526m3/ha, with the pruned volume making up 152m3/ha of this. In the second, total volume was 636m3/ha while volume of the pruned butt log was 218m3/ha. The two combinations resulted in a difference in total volume of 19% and in pruned volume of 37%.

DISCUSSION

1. TREE VOLUME

The inputs used for making predictions of tree volume were held constant so that the equations could be compared on an equal footing. There were large differences in the estimates of total volume made by the various tree volume tables, which confirmed that choice of which table to use was an important consideration.

Tables that were developed from sites in sand dune forests and Westland produced MAI curves that differed from the others. Volume tables developed from Sands sites gave predictions of total volume that tended to be higher than those from other regions. That result may seem surprising at first glance, as sites on sand soils are generally less productive than others. But it has to be remembered that in this study a common set of DBH and height inputs had been used in the comparisons. In fact diameter and height growth are depressed on sand sites due to nutrient and moisture deficits, so that values of both would be smaller than those used in the comparison and total volume at a given age also tends to be less than many other regions. When the standard set of diameter and height inputs was used with a table developed from data on sand dune sites, estimates of total volume tended to be higher than those for other regions. This was thought to be partly due to the fact that trees on sand sites have a tendency for their tops to be damaged so that they are relatively short for a given volume. When the standard set of inputs were used the tables from sand dune forests expected that for that given height there would be relatively large volumes.
Volume predictions from the Westland equation showed the opposite phenomenon but no explanation could be seen for this.

The fact that predictions of total volume from sand sites and Westland differed from the general pattern was consistent with the finding that height development of these two regions differed markedly from the rest of the country (Eggleston, 1991). MAI curves from the remaining regions covered ranges that were very similar to each other. Apart from the two exceptions, region did not appear to have a major influence on tree volume once DBH and height differences were removed.

It was expected that the thinning history of stands would affect the predictions made by volume equations that were developed from them. It is generally accepted that diameter growth is concentrated on the section of the stem immediately below the base of the green crown. At an early stage in the development of an unthinned stand, crown height begins to rise and follows at a fairly constant depth below top height, so that taper is not great up to the height of the green crown (Larson, 1963). Thus the volumes of trees from an unthinned stand of a given DBH and height was expected to be higher than those from a thinned stand, but this study found that *equations from unthinned stands tended to predict lower volumes than those from thinned stands.*

Reasons for that unexpected result were sought. The first point noted was that there was not a very wide sample of equations in the unthinned category, as few of the data sets had been recorded as having been developed from data sets that came exclusively from unthinned stands. Of those that were, all were from very early studies (early 1950s). Part of the apparent difference between thinned and unthinned tables could simply be due to a difference in methodology. The earliest tables had been prepared from hand smoothed curves and also the method of making sectional measurements has changed over time. Another point was that while the stands were not recorded as having been thinned, they could very well have been naturally thinned by *Sirex* attack. Many of the stands in the unthinned data set would have been planted in the 1920s and '30s, so there could also be genetic and possibly even climatic differences confounding the comparison. This unexpected result was seen as highlighting the complexity of the situation rather than disputing conventional wisdom about thinning effects on tree form.

Volume predictions made by tables developed from stands that had been pruned covered a similar range to those that were unpruned, which could be interpreted as meaning that *provided that diameter and height were the same*, pruning had no effect on tree volume. This lack of difference with pruning could be due to the fact that only two of the data sets in the comparison were from stands under 20 years old and pruning effects would be expected to diminish as stands age and the green crown rises naturally. The data set available for the pruning part of the comparison was even more limited than that for thinning and the comparison would have been subject to the same kinds of complicating factors.

In using any empirically derived prediction method it is prudent to limit its use to situations that lie within the range of data from which the relationships were derived. Plotting the limits of the base data showed that many of the equations were based on very narrow domains especially those developed from young stands of a single age. If use of one of the equations in table 2 is being considered, then special attention should be paid to ensuring that the trees for which volume is being estimated lie within the range of the data. On the other hand, just because the range of data covers the trees in question does not necessarily mean that a particular equation will be suitable, as the stand history and site could be very different.

2. TAPER

Taper tables are used to predict how volume will be distributed within the stem (eg. outturn by log grades). Choice of taper table had no effect on the total volume, as these equations merely re-distributed the total volume predicted by the tree volume table. Taper tables did influence the proportion of volume in various parts of the stem, especially the pruned butt log, which is the section most influenced by silvicultural and site differences. As the butt log is also the highest value section of the stem, the effect of taper table is magnified when carried on into economic evaluations.

3. VOLUME/TAPER TABLE COMBINATIONS

To get estimates of outturn by log grade, both taper and volume tables are used. If a compatible taper table had been developed along with the tree volume table, then that would be the obvious choice. However the older tree volume equations did not have taper tables associated with them (ie. those not highlighted in table 1). Someone may be satisfied with the prediction of total volume made by the tree volume table, in order to get estimates by log grade in cases where there is no compatible taper table they will have to link it to a non-compatible taper equation.

The combination of tree volume and taper tables chosen can have a large effect on predicted outturn (see figure 14). Generally the differences between realistic combinations will not be as great as this example, as it was an extreme and one of the recommendations of this study is that the Glenbervie/Whangapoua table should no longer be used (discussed later in this section). The question of which taper table to select in different situations would ideally be answered by sectionally measuring sample trees, but that was beyond the scope of this study. Instead, the results from the existing tables were subjectively compared to give an indication of what the best combinations were.

As already mentioned, where possible the taper equation that was compatible with the tree volume table would be the obvious choice. A survey conducted for the STANDPAK Users Group indicated that some respondents were applying non-compatible tables in situations where a compatible one was available. Rejecting a compatible taper table would only be justified where there were data to support the use of another.

In cases where there was not a compatible taper table, the first step was to compare results from the tree volume table at various ages with those of tables which did have a compatible taper table. Those that did not give similar volumes were rejected, because if the total volumes predicted by two tables was different, then there could be no way that the taper could be the same. But conversely, just because the total volume of two trees was identical did not mean that the shape of

tree form produced by the taper tables and reject oddities. The final stage involved subjectively taking account of factors such as regime, region, data range, and of how recent the tables were.

On the basis outlined above the following taper tables were suggested for situations where a tree volume table did not have a compatible taper table:

Table 3: Suggested Volume/Taper Table Combinations

9	AK	165 116 128	Tairua KANG Old Crop Esk
10	RO	116 237	KANG old Crop Transition
11	NN	116 232	KANG Old Crop LONG ages 14-24
12	CY	230 232 128	GDNS LONG ages 14-24 Esk
13	SD	227 224 218	Pomahaka Lismore ages 7-22 Mangatu 450/ha
14	All NZ S/belt	182 115	All NZ D. sawlog KANG Young Crop
39	KROI	116	KANG Old Crop
63	WAKA	116	KANG Old Crop
65	HOKO	116 232	KANG Old Crop LONG ages 14-24
73	MARMWOOD	165 116	TIRU KANG Old Crop
74	COFPWIPO	116 232	KANG Old Crop LONG ages 14-24
75	GLNS WHAF*	232	LONG ages 14-24
76	AUPOURI	188 205 212	Waiuku O/C WOOD O/C 2nd thin SANTOFT
77	OHMU RVHD	116 205	KANG Old Crop WOOD O/C 2nd thin
78	BALM UNTH	230 188 205	GDNS Waiuku WOOD O/C 2nd thin
87	Westland	232	LONG ages 14-24
89	BALM THN	232	LONG ages 14-24
109	ASHY	230 227 218	GDNS POMA 500 s/ha Mangatu 450/ha
126	OTGO	230 227	GDNS POMA 500/ha
134	GWAV	128 169	Esk Mohaka

*Use not recommended

One particular combination stood out, with the best match of taper table for the Glenbervie/Whangapoua tree volume table (number 75) was the one from stands at Longwood aged 14-24 years. This pairing was not logical, and confirmed earlier suspicions about the nature of that tree volume table.

4. General

When selecting volume and taper equations it is thought that the following characteristics should be used to match the trees/stand to be modelled, with the data from which each table was developed (ranked in order of importance):

Species, tree stock
Site (forest, area or region, site, altitude etc.)
DBH within the range of base data
Tree heights within the range of base data
Age range
Treatment history (including site preparation)

If a choice of candidates remains then choose:

More recent tables over older ones
Compatible pairs of volume and taper tables over non-compatible tables
Tables based on a large sample size
Those with a wider range of DBH and height

Wherever possible, actual data from approximately 50 sectionally measured trees should be gathered to validate the chosen equation. Where no existing equation can be found to fit the stand in question, then data from at least 100 trees is required in order to be able to develop a new one (Gordon & Penman 1987).

The very narrow range of base data for the 14 equations referred to in table 2 indicated that special care should be taken when considering their use. It is suggested that the Glenbervie/Whangapoua tree volume table should not be used due to its highly irregular behaviour. The Woodhill Old Crop table also differed from the general pattern, which could be partly attributed to site and regime but was thought to be largely an artifact of the extremely limited range of base data.

When tree volume tables were developed for young crop and for old crop stands in Kaingaroa forest, the data were fitted with two different forms of equation. The first pair, 115 (young crop) and 116 (old crop) were of the logarithmic form which was used in all subsequent tables, while weighted equations were tried in 118 and 119. Though the data sets were identical the difference in formulation gave slightly different results. The weighted equations do not have compatible taper tables and as no reason was seen for using them over the logarithmic form, it is suggested that 118 and 119 not be used.

Research is being carried out aimed at replacing the current collection of tables with single equations for radiata pine in New Zealand, with variables to account for not only tree size but site, age and regime differences. A project is being undertaken by the School of Forestry at the University of Canterbury to develop an equation for the Stand Growth Modelling Co-operative using dummy variate analysis, concentrating mainly on data from Otago. FRI has been carrying out basic research into the problem under government funding, with a segmented taper equation approach appearing to have promise.

CONCLUSIONS

The choice of volume and taper tables has a large effect on results. In one case the combined effect of the two factors resulted in predictions differing by 110m3/ha (19%) for total volume and 66m3/ha (36%) for pruned log volume.

The Glenbervie/Whangapoua tree volume table should not be used and the Woodhill Old Crop tables should be regarded with caution.

Before using any of the equations the range of base data should be checked against the size of trees for which predictions are to be made. Special attention should be paid to tables 65, 87, 89, 126, 167, 183, 188, 196, 205, 214, 218, 232, and 235 which are applicable to only narrow ranges of diameter and height.

Tables from the sand dune forests and Westland should be applied strictly to those areas, as they tended to produce results which were different to those from the rest of the country.

When selecting volume and taper equations the following criteria should be used to match the trees/stand to be modelled with the data from which each table was developed (ranked in order of importance):

Species, tree stock
Site (forest, area or region, site, altitude etc.)
DBH within the range of base data
Tree heights within the range of base data
Age range
Treatment history (including site preparation)
Date developed
Compatible pairs of volume and taper tables over non-compatible tables
Sample size
Width of DBH and height range

Where possible the choice of taper equation should be compatible with the tree volume equation being used. For tree volume equations for which there is no compatible taper table, suggestions are given in table 3.

The effects of individual factors were masked by interactions. There would be nothing to be gained by further comparisons of the functions themselves, without looking at actual data.

ACKNOWLEDGEMENTS

The author would like to thank Andrew Gordon for the suggestions he made throughout this project.

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APPENDICES

1. TREE VOLUME TABLES Available on FRI Modelling System (all species)

Log Assortment V4.02 TV250 Mon Mar 09 13:29:24 1992

MOF Internal Copy (#001-67C7)

Tree Volume Tables

Table	Volume	Applies to Species	Data from	Date	DBH Min	DBH Max	Height Min	Height Max	Mean
5	ALLSP	ALL NZ	SECTIONAL M.	0	1	999	2	99	0.000
9	P.RAD	AK	MARMPUHITIRU	1952	8	58	6	37	1.200
10	P.RAD	RO	KANGWAKAROEU	1953	5	97	3	52	5.650
11	P.RAD	NN	GDNSWIRU	1952	8	99	6	49	5.390
12	P.RAD	CY	ALL CY	1952	8	89	6	43	3.890
13	P.RAD	SD	ALL SD	1952	10	94	9	43	4.070
14	P.RAD	ALL NZ SHELTBELT	ALL NZ	1977	31	132	17	53	2.040
16	P.LCO	RO	KANGWAKA	1952	8	61	3	37	0.470
17	P.LCO	SD	SD	1954	5	66	3	34	0.470
18	P.PON	ALL NZ NOT SD	KANGWAKA	1956	5	79	3	46	3.470
20	P.CNG	ALL NZ	ALL NZ	1954	5	41	3	24	0.290
21	L.DEC	ALL NZ	RO WN NNCYSD	1956	5	84	3	37	0.600
22	P.MCA	ALL NZ	ROAKWNNNCYWD	1958	13	74	6	37	2.760
23	CHLAW	ALL NZ	ALL NZ	1958	5	76	3	37	2.200
24	P.STB	ALL NZ	RO	1953	10	46	12	27	0.890
25	P.ELL	ALL NZ	AK RO	1953	10	43	9	24	0.610
26	P.PAL	ALL NZ	AK RO	1958	8	33	3	21	0.280
27	P.PTA	ALL NZ	AK RO	1954	8	46	9	24	0.490
28	P.PIN	ALL NZ	WIPO	1954	5	64	6	27	0.570
29	P.TAE	ALL NZ	AK RO	1953	10	56	9	30	1.340
31	SQSEM	ALL NZ	AK RO	1959	10	122	3	51	7.140
32	P.ECH	ALL NZ	AK	1960	8	48	6	18	0.750
34	EUFAS	TARANAKI	OAKURA	1959	28	79	6	34	2.790
35	P.SCP	ALL NZ	RO CY SD	1960	10	41	6	34	0.390
36	P.AUS	ALL NZ	RO CY SDWNNN	1960	10	71	9	30	1.850
37	THPLI	ALL NZ	AK RO WNNNSD	1961	5	56	3	24	1.050
38	EU	ALL NZ	ALL NZ	1961	13	94	3	34	4.030
39	P.RAD	KROI	KROI	1961	20	64	18	40	1.730
40	CUMAC	ALL NZ	ALL NZ	1961	5	66	3	31	1.880
41	PISIT	ALL NZ	WD SD	1961	8	33	10	23	0.430
42	PIABI	ALL NZ	RO CY SD	1961	8	46	7	25	0.860
43	DCCUP	WD POLE STANDS	WD	1978	10	24	11	27	0.260
44	HDWDS	AK INDIG HARDWDS	AK	1978	5	52	5	23	0.940
45	CRJAP	ALL NZ	AK RO WNNNSD	1964	5	48	4	22	0.650
63	P.RAD	WAKA	WAKA	1968	16	69	16	39	1.260
65	P.RAD	HOKO	HOKO	1969	24	63	22	42	1.710
73	P.RAD	MARMWOODPUHIATHN	GROUP 1 AK	1975	8	63	6	46	1.050

74	P.RAD	COFP WIPO	GROUP 2 AK	1969	9	64	5	38	1.060
75	P.RAD	GLNB WHAP	GROUP 3 AK	1969	7	59	8	37	0.530
76	P.RAD	AUPO	GROUP 4 AK	1969	20	84	20	41	1.730
77	P.RAD	OMHU RVHD	GROUP 5 AK	1969	8	55	10	46	0.760
78	P.RAD	BALM	BALM	1969	16	82	17	41	1.150
87	P.RAD	WD	WMWDNEMOGRAN	1969	9	47	8	31	0.270
89	P.RAD	BALM	BALM	1969	13	50	7	27	0.320
92	FREXC	ALL NZ		1962	10	50	3	25	0.000
93	QU	ALL NZ	0 0.000000E	1962	10	50	3	25	0.000
94		OTHER BROADLVS.	0 0.000000E	1962	10	50	3	25	0.000
95		OTHER CONIFERS	SD P.LCO	1962	5	66	3	34	0.470
97	P.LCO	ALL AK	SD	1962	5	66	3	34	0.470
99	P.LCO	ALL WN	KANG WAKA	1962	8	61	3	37	0.470
101	P.LCO	HANM LOW ALT.	HANM	1971	16	45	17	32	0.810
103	P.PON	WTAP	WTAP	1972	19	60	15	31	0.550
107	P.LCO	OMIH	OMIH	1970	5	30	6	15	0.100
109	P.RAD	ASHY	ASHY	1971	14	62	14	38	0.880
113	PO	ALL NZ	RO WN	1972	17	71	16	43	0.960
114	P.PON	KANG	KANG	1975	11	44	7	22	0.260
115	P.RAD	KANG YOUNG CROP	KANG	1975	15	64	21	41	1.070
116	P.RAD	KANG OLD CROP	KANG	1975	15	102	14	56	2.220
117	P.PON	KANG	KANG	1975	11	44	7	22	0.260
118	P.RAD	KANG YOUNG CROP	KANG	1975	15	64	21	41	1.070
119	P.RAD	KANG OLD CROP	KANG	1975	15	102	14	56	2.220
120	PSMEN	ASHY	ASHY	1973	8	30	9	23	0.280
121	P.LCO	HANM HIGH ALT.	HANM	1975	26	50	19	25	1.030
125	AGAUS	ALL NZ	AK RO	1978	26	218	6	26	11.530
126	P.RAD	OTCO	OTCO	1974	12	47	8	30	1.000
128	P.RAD	ESK	ESK	1976	6	55	5	38	0.530
129	NO	ALL NZ	WN NNWDSD	1978	21	122	3	24	1.710
130	AGAUS	ALL NZ POLE STDS	AK	1978	4	36	5	26	0.190
131	DCCUP	ALL NZ MATURE	RO SDNNWD	1978	25	183	3	33	4.360
132	BSTAW	ALL NZ MATURE	RO	1978	31	98	3	18	1.360
133	NO	WD POLE STANDS	WD	1978	16	41	2	23	0.370
134	P.RAD	GWAV	GWAV	1976	8	68	6	40	0.330
136	PSMEN	ALL NZ	ALL NZ	1977	5	150	6	49	1.200
138	DCCUP	WD	WD	1978	25	111	5	31	1.640
139	PLCO	ALL NZ	ALL NZ	1977	4	66	4	40	2.820
141	PLCO	KROI HIGH ALT.	KROI	1980	10	66	8	28	0.900
145	L.DEC	HANM	HANM	1979	11	45	11	30	0.400
149	P.RAD	WTRE	WTRE	1980	8	78	12	37	1.780
152	L.KAE	GDNS	GDNS	1980	10	27	14	28	0.250
163	P.RAD	NGAU	NGAU	1984	16	75	10	41	1.790
165	P.RAD	TIRU	TIRU	1981	12	97	12	52	2.110
167	P.RAD	LTAU 1000 THIN.	L.TAUPO	1982	11	30	10	22	0.240
169	P.RAD	MOHA	MOHA	1981	25	65	16	33	1.610
182	P.RAD	ALL NZ D.SAW LOG	AKROWNNNSD	1980	32	78	23	46	2.200
183	P.RAD	WOOD O/C	WOODHILL	1982	33	69	25	40	2.530
188	P.RAD	WUKU	WAIUKU	1983	30	65	24	40	2.030
190	P.LCO	TIRU	TAIRUA	1983	7	42	6	22	0.200
196	P.RAD	ROEU	ROTOEHU	1983	37	76	36	50	2.980
205	P.RAD	WOOD O/C 2 THIN	WOODHILL	1983	17	50	17	35	0.860
206	P.RAD	MARM 2 CROP	MARAMARUA	1984	11	82	16	45	1.920
212	P.RAD	SANTOFT	SANTOFT	1984	16	57	11	37	1.200
214	P.RAD	MGAT 250-320 sph	MANGATU	1984	35	64	24	39	2.130

218	P.RAD	MGAT	450 sph	Mangatu	1985	28	66	24	43	1.830
224	P.RAD	LISM	ages 7-22	Lismore	1985	16	60	8	36	1.470
226	P.LCO	LONG	ages 23,24	Woodlaw Blk	1985	7	30	7	16	0.190
227	P.RAD	POMA	500sph ag30	Pukerau Blk.	1986	37	65	28	38	2.290
228	PSMEN	LONG	age 33-37	Longwood	1986	11	61	14	31	0.710
230	P.RAD	GDNS	ages 26-30	Long Gully	1986	16	62	19	43	1.590
231	P.RAD	TEWR	ages 9-31	Te Wera	1986	20	70	14	50	2.650
232	P.RAD	LONG	ages 14-24	Woodlaw Blk	1986	9	32	7	19	0.180
235	P.RAD	LONG	age30sph370	LONG Cpt29	1986	30	67	27	39	2.260
236	P.RAD	WOOD	370sph	WOOD Cpt67,6	1986	20	63	25	37	1.470
237	P.RAD	KANG	Trans. crop	KANG	1987	28	69	32	49	2.460

2. TAPER TABLES Available on FRI Modelling System (all species)

Log Assortment V4.02 TV250 Mon Mar 09 13:30:03 1992

MOF Internal Copy (#001-67C7)

Tree Taper Tables

Table	Applies to	Data from	Date	DBH		Height		Volume
	Species			Min	Max	Min	Max	Mean
5	ALLSP ALL NZ	SECTIONAL M.	0 1	999	2	99		0.000
21	L.DEC ALL NZ	RO WNNNCYSD	1956 5	84	3	37		2.390
114	P.PON KANG	KANG	1975 11	44	7	22		0.260
115	P.RAD KANG YOUNG CROP	KANG	1975 15	64	21	41		1.070
116	P.RAD KANG OLD CROP	KANG	1975 15	102	14	56		2.220
128	P.RAD ESK	ESK	1976 6	55	5	38		0.530
136	PSMEN ALL NZ	ALL NZ	1977 5	150	6	49		1.200
139	P.LCO ALL NZ	ALL NZ	1977 4	66	4	40		2.820
145	L.DEC HANM	HANM	1979 11	45	11	30		0.400
149	P.RAD WTRE	WTRE	1980 8	78	12	37		1.780
163	P.RAD NGAU	NGAU	1984 16	75	10	41		1.790
165	P.RAD TIRU	TAIRUA	1983 12	95	12	52		2.110
167	P.RAD LTAU 1000 THIN	L.TAUPO	1982 11	30	10	22		0.240
169	P.RAD MOHA	MOHAKA	1981 25	65	16	33		1.610
182	P.RAD ALL NZ D.SAW LOG	AKROWNNNSD	1980 32	78	23	46		2.200
183	P.RAD WOOD	WOODHILL	1982 33	69	25	40		2.530
188	P.RAD WUKU	WAIUKU	1983 30	65	24	40		2.030
190	P.LCO TIRU	TAIRUA	1983 7	42	6	22		0.200
196	P.RAD ROEU	ROTOEHU	1983 37	76	36	50		2.980
205	P.RAD WOOD O/C 2 THIN	WOODHILL	1983 17	50	17	35		0.860
206	P.RAD MARM 2 CROP	MARAMARUA	1984 10	82	16	42		1.920
212	P.RAD SANTOFT	SANTOFT	1984 16	57	11	37		1.200
214	P.RAD MGAT 250-320 sph	MANGATU	1984 35	64	24	39		2.130
218	P.RAD MGAT 450 sph	Mangatu	1985 28	66	24	43		1.830
224	P.RAD LISM ages 7-22	Lismore	1985 16	60	8	36		1.470
226	P.LCO LONG ages 23,24	Woodlaw Blk	1985 7	30	7	16		0.190
227	P.RAD POMA 500sph ag30	Pukerau Blk.	1986 37	65	28	38		2.290
228	PSMEN LONG age 33-37	Longwood	1986 11	61	14	31		0.710
230	P.RAD GDNS ages 26-30	Long Gully	1986 16	62	19	43		1.590
231	P.RAD TEWR ages 9-31	Te Wera	1986 20	70	14	50		2.650
232	P.RAD LONG ages 14-24	Woodlaw Blk	1986 9	32	7	19		0.180
235	P.RAD LONG age30sph370	LONG Cpt29	1986 30	67	27	39		2.260
236	P.RAD WOOD 370sph	WOOD Cpt67,6	1986 20	63	25	37		1.470
237	P.RAD KANG Trans. crop	KANG	1987 28	69	32	49		2.460

3. DETAILS of TREE VOLUME TABLES for Radiata Pine

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Log Assortment V4.02    TV250                          Mon Mar 09 13:31:06 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 9 for predicting total stem volume.

 Table applies to P.RAD in AK                (forest(s)/region).

 Table based on data from MARMPUHITIRU.  Calculated in 1952

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.790000E+00  1.110000E+00  -1.017091E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.1           7.0

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
       8         58           6          37         1.200

 A total of 470 sectionally measured trees were used.
```

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Log Assortment V4.02    TV250                          Mon Mar 09 13:31:40 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 10 for predicting total stem volume.

 Table applies to P.RAD in RO                (forest(s)/region).

 Table based on data from KANGWAKAROEU.  Calculated in 1953

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.711000E+00  1.196000E+00  -1.018942E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           7.6

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
       5         97           3          52         5.650

 A total of 1520 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:32:00 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 11 for predicting total stem volume.

 Table applies to P.RAD in NN                (forest(s)/region).

 Table based on data from GDNSWIRU.  Calculated in 1952

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.824000E+00  1.061000E+00  -1.014331E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.1           6.5

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
       8         99           6          49         5.390

 A total of 526 sectionally measured trees were used.
```

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Log Assortment V4.02    TV250                          Mon Mar 09 13:32:16 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 12 for predicting total stem volume.

 Table applies to P.RAD in CY                (forest(s)/region).

 Table based on data from ALL CY.  Calculated in 1952

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.936000E+00  9.550000E-01  -1.018131E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
              -0.1           5.8

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
       8         89           6          43         3.890

 A total of 665 sectionally measured trees were used.
```

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Log Assortment V4.02    TV250                          Mon Mar 09 13:32:34 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 13 for predicting total stem volume.

 Table applies to P.RAD in SO                (forest(s)/region).

 Table based on data from ALL SO.  Calculated in 1952

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.865000E+00  1.071000E+00  -1.028214E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           6.6

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      10         94           9          43         4.070

 A total of 365 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:32:47 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 14 for predicting total stem volume.

 Table applies to P.RAD in ALL NZ SHELTBELT (forest(s)/region).

 Table based on data from ALL NZ.  Calculated in 1977

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.838994E+00  1.090100E+00  -1.029435E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           9.3

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      31         132          17          53         2.040

 A total of 505 sectionally measured trees were used.
```

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Log Assortment V4.02    TV250                          Mon Mar 09 13:33:00 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 39 for predicting total stem volume.

 Table applies to P.RAD in KROI              (forest(s)/region).

 Table based on data from KROI.  Calculated in 1961

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.589000E+00  1.164000E+00  -9.622324E+00  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.1           8.5

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      20         64          18          40         1.730

 A total of 112 sectionally measured trees were used.
```

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Log Assortment V4.02    TV250                          Mon Mar 09 13:33:11 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 63 for predicting total stem volume.

 Table applies to P.RAD in WAKA              (forest(s)/region).

 Table based on data from WAKA.  Calculated in 1968

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.719636E+00  1.198256E+00  -1.026115E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           8.0

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      16         69          16          39         1.260

 A total of 95 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:33:23 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 65 for predicting total stem volume.

 Table applies to P.RAD in HOKO              (forest(s)/region).

 Table based on data from HOKO.  Calculated in 1969

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.763520E+00  1.006367E+00  -9.685393E+00  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           8.6

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      24         63          22          42         1.710

 A total of 193 sectionally measured trees were used.



Log Assortment V4.02    TV250                          Mon Mar 09 13:33:34 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 73 for predicting total stem volume.

 Table applies to P.RAD in MARMWOODPUHIATHN (forest(s)/region).

 Table based on data from GROUP 1  AK.  Calculated in 1975

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.825495E+00  1.137280E+00  -1.041301E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           10.2

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      8          63          6           46         1.050

 A total of 303 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:33:45 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 74 for predicting total stem volume.

 Table applies to P.RAD in COFP WIPO        (forest(s)/region).

 Table based on data from GROUP 2  AK.  Calculated in 1969

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.730003E+00  1.175242E+00  -1.015155E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           6.8

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
       9         64           5          38         1.060

 A total of 159 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:33:55 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 75 for predicting total stem volume.

 Table applies to P.RAD in GLNB WHAP        (forest(s)/region).

 Table based on data from GROUP 3  AK.  Calculated in 1969

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.789387E+00  9.440280E-01  -9.647037E+00  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           8.4

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
       7         59           8          37         0.530

 A total of 149 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:34:10 1992
                         MOF Internal Copy (#001-67C7)

     Tree Volume Table 76 for predicting total stem volume.

 Table applies to P.RAD in AUPO              (forest(s)/region).

 Table based on data from GROUP 4  AK.  Calculated in 1969

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
1.975576E+00  9.475830E-01  -1.021389E+01  0.000000E+00
       B5            B6            B7            B8            B9
0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           7.2

 Range of data:
 min DBH(cm)   max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      20         84          20          41         1.730

 A total of 178 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:34:23 1992
                         MOF Internal Copy (#001-67C7)

     Tree Volume Table 77 for predicting total stem volume.

 Table applies to P.RAD in OMHU RVHD         (forest(s)/region).

 Table based on data from GROUP 5  AK.  Calculated in 1969

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
1.841934E+00  1.190602E+00  -1.071381E+01  0.000000E+00
       B5            B6            B7            B8            B9
0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           8.2

 Range of data:
 min DBH(cm)   max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      8          55          10          46         0.760

 A total of 158 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:34:47 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 78 for predicting total stem volume.

 Table applies to P.RAD in BALM              (forest(s)/region).

 Table based on data from BALM.  Calculated in 1969

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.807887E+00  1.294424E+00  -1.088625E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           8.1

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      16         82          17          41         1.150

 A total of 145 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:34:56 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 87 for predicting total stem volume.

 Table applies to P.RAD in WD                (forest(s)/region).

 Table based on data from WMWDNEMOGRAN.  Calculated in 1969

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.678506E+00  1.225598E+00  -1.023629E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           6.7

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      9          47          8           31         0.270

 A total of 305 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:35:05 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 89 for predicting total stem volume.

 Table applies to P.RAD in BALM              (forest(s)/region).

 Table based on data from BALM.  Calculated in 1969

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.805338E+00  1.088256E+00  -1.022221E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           6.5

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      13          50           7           27          0.320

 A total of 163 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:35:16 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 109 for predicting total stem volume.

 Table applies to P.RAD in ASHY              (forest(s)/region).

 Table based on data from ASHY.  Calculated in 1971

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.790329E+00  1.276349E+00  -1.070889E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           6.9

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      14          62          14          38          0.880

 A total of 263 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:35:25 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 115 for predicting total stem volume.

 Table applies to P.RAD in KANG  YOUNG CROP (forest(s)/region).

 Table based on data from KANG.  Calculated in 1975

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1           B2           B3           B4
 1.826400E+00  1.128690E+00  -1.038500E+01  0.000000E+00
       B5           B6           B7           B8           B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           0.0

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      15         64          21          41         1.070

 A total of 353 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:35:42 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 116 for predicting total stem volume.

 Table applies to P.RAD in KANG    OLD CROP (forest(s)/region).

 Table based on data from KANG.  Calculated in 1975

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1           B2           B3           B4
 1.746550E+00  1.243000E+00  -1.052130E+01  0.000000E+00
       B5           B6           B7           B8           B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           0.0

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      15         102         14          56         2.220

 A total of 914 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:35:52 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 118 for predicting total stem volume.

 Table applies to P.RAD in KANG  YOUNG CROP (forest(s)/region).

 Table based on data from KANG.  Calculated in 1975

        Function used is :
V = B1  +  B2 *(DBH)**2 *H/10000  +  B3 *(DBH)**2 /10000  +  B4 *H

 Coefficients:
       B1           B2           B3           B4
 0.000000E+00  2.593400E-01  0.000000E+00  1.341000E-03
       B5           B6           B7           B8           B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias     % std. error
               0.0          0.0

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      15         64          21          41         1.070

 A total of 353 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:36:01 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 119 for predicting total stem volume.

 Table applies to P.RAD in KANG    OLD CROP (forest(s)/region).

 Table based on data from KANG.  Calculated in 1975

        Function used is :
V = B1  +  B2 *(DBH)**2 *H/10000  +  B3 *(DBH)**2 /10000  +  B4 *H

 Coefficients:
       B1           B2           B3           B4
 0.000000E+00  2.401900E-01  0.000000E+00  2.155000E-03
       B5           B6           B7           B8           B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias     % std. error
               0.0          0.0

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      15         102         14          56         2.220

 A total of 914 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:36:13 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 126 for predicting total stem volume.

 Table applies to P.RAD in OTCO              (forest(s)/region).

 Table based on data from OTCO.  Calculated in 1974

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.801022E+00  1.148053E+00  -1.030559E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           8.9

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      12         47           8           30          1.000

 A total of 265 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:36:27 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 128 for predicting total stem volume.

 Table applies to P.RAD in ESK               (forest(s)/region).

 Table based on data from ESK.  Calculated in 1976

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.769615E+00  1.116807E+00  -1.010131E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           8.3

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      6          55           5           38          0.530

 A total of 342 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:36:39 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 134 for predicting total stem volume.

 Table applies to P.RAD in GWAV             (forest(s)/region).

 Table based on data from GWAV.  Calculated in 1976

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.760826E+00  1.124560E+00  -1.008428E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           7.6

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
       8         68           6          40         0.330

 A total of 338 sectionally measured trees were used.


Log Assortment V4.02    TV250                          Mon Mar 09 13:36:50 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 149 for predicting total stem volume.

 Table applies to P.RAD in WTRE             (forest(s)/region).

 Table based on data from WTRE.  Calculated in 1980

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.944758E+00  9.953370E-01  -1.027749E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
              -0.9           8.3

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
       8         78          12          37         1.780

 A total of 210 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:37:02 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 163 for predicting total stem volume.

 Table applies to P.RAD in NGAU              (forest(s)/region).

 Table based on data from NGAU.  Calculated in 1984

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.765903E+00  1.246562E+00  -1.055614E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
              -0.2           7.1

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      16         75          10          41         1.790

 A total of 130 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:37:21 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 165 for predicting total stem volume.

 Table applies to P.RAD in TIRU              (forest(s)/region).

 Table based on data from TIRU.  Calculated in 1981

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.938020E+00  9.077050E-01  -1.002216E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
              -0.5           11.4

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      12         97          12          52         2.110

 A total of 123 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:37:32 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 167 for predicting total stem volume.

 Table applies to P.RAD in LTAU  1000 THIN. (forest(s)/region).

 Table based on data from L.TAUPO.  Calculated in 1982

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.767205E+00  1.200469E+00  -1.032249E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           7.6

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      11         30          10          22         0.240

 A total of 102 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:37:43 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 169 for predicting total stem volume.

 Table applies to P.RAD in MOHA              (forest(s)/region).

 Table based on data from MOHA.  Calculated in 1981

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.748975E+00  1.167716E+00  -1.018709E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
              -0.1           5.8

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      25         65          16          33         1.610

 A total of 103 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:37:54 1992
                         MOF Internal Copy (#001-67C7)

     Tree Volume Table 182 for predicting total stem volume.

 Table applies to P.RAD in ALL NZ D.SAW LOG (forest(s)/region).

 Table based on data from AKROWNNNSD.  Calculated in 1980

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.790680E+00  1.074730E+00  -1.003201E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           6.0

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      32         78          23          46         2.200

 A total of 244 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:38:05 1992
                         MOF Internal Copy (#001-67C7)

     Tree Volume Table 183 for predicting total stem volume.

 Table applies to P.RAD in WOOD O/C          (forest(s)/region).

 Table based on data from WOODHILL.  Calculated in 1982

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.806523E+00  1.369037E+00  -1.101070E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
              -0.1           7.4

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      33         69          25          40         2.530

 A total of 126 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:38:14 1992
                         MOF Internal Copy (#001-67C7)


     Tree Volume Table 188 for predicting total stem volume.

 Table applies to P.RAD in WUKU              (forest(s)/region).

 Table based on data from WAIUKU.  Calculated in 1983

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 2.130677E+00  9.020020E-01  -1.066020E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           9.6

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      30         65          24          40         2.030

 A total of 101 sectionally measured trees were used.




Log Assortment V4.02    TV250                          Mon Mar 09 13:38:23 1992
                         MOF Internal Copy (#001-67C7)


     Tree Volume Table 196 for predicting total stem volume.

 Table applies to P.RAD in ROEU              (forest(s)/region).

 Table based on data from ROTOEHU.  Calculated in 1983

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.880759E+00  7.487740E-01  -9.170591E+00  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           7.8

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      37         76          36          50         2.980

 A total of 100 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:38:36 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 205 for predicting total stem volume.

 Table applies to P.RAD in WOOD O/C 2 THIN  (forest(s)/region).

 Table based on data from WOODHILL.  Calculated in 1983

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1           B2           B3           B4
 1.948091E+00  9.568970E-01  -1.016265E+01  0.000000E+00
       B5           B6           B7           B8           B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias     % std. error
               0.2          7.1

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      17         50          17          35         0.860

 A total of 97 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:38:48 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 206 for predicting total stem volume.

 Table applies to P.RAD in MARM 2 CROP      (forest(s)/region).

 Table based on data from MARAMARUA.  Calculated in 1984

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1           B2           B3           B4
 2.075237E+00  6.904680E-01  -9.669720E+00  0.000000E+00
       B5           B6           B7           B8           B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias     % std. error
               0.1          7.7

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      11         82          16          45         1.920

 A total of 101 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:38:57 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 212 for predicting total stem volume.

 Table applies to P.RAD in SANTOFT          (forest(s)/region).

 Table based on data from SANTOFT.  Calculated in 1984

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.748708E+00  1.123392E+00  -9.973939E+00  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           5.5

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      16         57          11          37         1.200

 A total of 94 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:39:07 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 214 for predicting total stem volume.

 Table applies to P.RAD in MGAT 250-320 sph (forest(s)/region).

 Table based on data from MANGATU.  Calculated in 1984

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.775274E+00  1.077407E+00  -9.904273E+00  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.0           6.7

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      35         64          24          39         2.130

 A total of 104 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:39:19 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 218 for predicting total stem volume.

 Table applies to P.RAD in MGAT 450 sph     (forest(s)/region).

 Table based on data from Mangatu.  Calculated in 1985

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
1.799573E+00  1.165804E+00  -1.035735E+01  0.000000E+00
       B5            B6            B7            B8            B9
0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
              -0.1           5.2

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      28         66          24          43         1.830

 A total of 104 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:39:30 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 224 for predicting total stem volume.

 Table applies to P.RAD in LISM ages 7-22   (forest(s)/region).

 Table based on data from Lismore.  Calculated in 1985

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
1.780652E+00  1.135053E+00  -1.018302E+01  0.000000E+00
       B5            B6            B7            B8            B9
0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
              -0.2           5.5

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      16         60          8           36         1.470

 A total of 111 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:39:39 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 227 for predicting total stem volume.

 Table applies to P.RAD in POMA 500sph ag30 (forest(s)/region).

 Table based on data from Pukerau Blk..  Calculated in 1986

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1           B2           B3           B4
 1.889000E+00  1.122600E+00  -1.054122E+01  0.000000E+00
       B5           B6           B7           B8           B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias     % std. error
               0.0          6.1

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      37         65          28          38         2.290

 A total of 87 sectionally measured trees were used.




Log Assortment V4.02    TV250                          Mon Mar 09 13:39:47 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 230 for predicting total stem volume.

 Table applies to P.RAD in GDNS ages 26-30  (forest(s)/region).

 Table based on data from Long Gully.  Calculated in 1986

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1           B2           B3           B4
 1.847867E+00  1.079014E+00  -1.026160E+01  0.000000E+00
       B5           B6           B7           B8           B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias     % std. error
               0.3          5.5

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      16         62          19          43         1.590

 A total of 92 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:39:55 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 231 for predicting total stem volume.

 Table applies to P.RAD in TEWR ages 9-31   (forest(s)/region).

 Table based on data from Te Wera.  Calculated in 1986

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.734760E+00  1.151587E+00  -1.007873E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.1           6.6

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      20          70          14          50          2.650

 A total of 103 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:40:07 1992
                        MOF Internal Copy (#001-67C7)

     Tree Volume Table 232 for predicting total stem volume.

 Table applies to P.RAD in LONG ages 14-24  (forest(s)/region).

 Table based on data from Woodlaw Blk.  Calculated in 1986

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.765996E+00  1.104103E+00  -1.009289E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias      % std. error
               0.1           6.9

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      9           32          7           19          0.180

 A total of 105 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:40:18 1992
                         MOF Internal Copy (#001-67C7)


      Tree Volume Table 235 for predicting total stem volume.

 Table applies to P.RAD in LONG age30sph370 (forest(s)/region).

 Table based on data from LONG Cpt29.  Calculated in 1986

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.869605E+00  1.202020E+00  -1.072714E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias     % std. error
               0.1           6.3

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      30         67          27          39         2.260

 A total of 96 sectionally measured trees were used.




Log Assortment V4.02    TV250                          Mon Mar 09 13:40:33 1992
                         MOF Internal Copy (#001-67C7)


      Tree Volume Table 236 for predicting total stem volume.

 Table applies to P.RAD in WOOD 370sph       (forest(s)/region).

 Table based on data from WOOD Cpt67,6.  Calculated in 1986

        Function used is :
V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3)  +  B4

 Coefficients:
       B1            B2            B3            B4
 1.853167E+00  1.168399E+00  -1.055538E+01  0.000000E+00
       B5            B6            B7            B8            B9
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  % bias     % std. error
               0.0           7.3

 Range of data:
 min DBH(cm)  max DBH(cm) min Height(m) max Height(m) mean Volume(cubic m)
      20         63          25          37         1.470

 A total of 121 sectionally measured trees were used.
```

Log Assortment V4.02 TV250 Mon Mar 09 13:40:42 1992
MOF Internal Copy (#001-67C7)

Tree Volume Table 237 for predicting total stem volume.

Table applies to P.RAD in KANG Trans. crop (forest(s)/region).

Table based on data from KANG. Calculated in 1987

Function used is :

V = (DBH)**B1 * (H**2/(H-BreastHeight))**B2 * Exp(B3) + B4

Coefficients:

B1	B2	B3	B4	
1.760385E+00	1.048023E+00	-9.805884E+00	0.000000E+00	
B5	B6	B7	B8	B9
0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00

Accuracy : % bias % std. error
0.0 5.9

Range of data:

min DBH(cm)	max DBH(cm)	min Height(m)	max Height(m)	mean Volume(cubic m)
28	69	32	49	2.460

A total of 88 sectionally measured trees were used.

4. DETAILS of TAPER TABLES for Radiata Pine

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:41:40 1992
                        MOF Internal Copy (#001-67C7)

  Tree Taper Table 115 for predicting stem diameters
   and volumes of stem sections.

 Table applies to P.RAD in KANG  YOUNG CROP (forest(s)/region).

 Table based on data from KANG.  Calculated in 1975

        Function used is :
d**2 = V/(K*H) * ( B1*X**1 + B2*X**2 + B3*X**3 + B4*X**4 +
          B5*X**5 + B6*X**B7 + B8*X**B9 )

 Coefficients:
       B1            B2            B3            B4            B5
 1.171400E+00  -3.545200E+00  2.670800E+01  -4.431000E+01  2.268600E+01
       B6            B7            B8            B9            B10
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  bias (cm)      std. error (cm)
               3.40           1.40

 Range of data:
     DBH (cm)          Height (m)        mean Volume (cubic m)
   min     max       min      max
    15      64        21       41               1.070

 A total of 353 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:41:58 1992
                        MOF Internal Copy (#001-67C7)

  Tree Taper Table 116 for predicting stem diameters
   and volumes of stem sections.

 Table applies to P.RAD in KANG OLD CROP    (forest(s)/region).

 Table based on data from KANG.  Calculated in 1975

        Function used is :
d**2 = V/(K*H) * ( B1*X**1 + B2*X**2 + B3*X**3 + B4*X**4 +
          B5*X**5 + B6*X**B7 + B8*X**B9 )

 Coefficients:
       B1            B2            B3            B4            B5
 1.477400E+00  -6.081900E+00  3.281300E+01  -5.048900E+01  2.510000E+01
       B6            B7            B8            B9            B10
 0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  bias (cm)      std. error (cm)
               5.10           2.40

 Range of data:
     DBH (cm)          Height (m)        mean Volume (cubic m)
   min     max       min      max
    15     102        14       56               2.220

 A total of 914 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                        Mon Mar 09 13:42:07 1992
                        MOF Internal Copy (#001-67C7)

  Tree Taper Table 128 for predicting stem diameters
   and volumes of stem sections.

 Table applies to P.RAD in ESK              (forest(s)/region).

 Table based on data from ESK.  Calculated in 1976

        Function used is :
d**2 = V/(K*H) * ( B1*X**1 + B2*X**2 + B3*X**3 + B4*X**4 +
          B5*X**5 + B6*X**B7 + B8*X**B9 )

 Coefficients:
       B1            B2            B3            B4            B5
 1.133900E+00  0.000000E+00  4.213200E+00 -3.366100E+00  0.000000E+00
       B6            B7            B8            B9            B10
 1.006500E+00  1.800000E+01  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  bias (cm)     std. error (cm)
                0.13          1.40

 Range of data:
     DBH (cm)          Height (m)        mean Volume (cubic m)
   min     max       min      max
     6      55         5       38                0.530

 A total of 342 sectionally measured trees were used.



Log Assortment V4.02    TV250                        Mon Mar 09 13:42:20 1992
                        MOF Internal Copy (#001-67C7)

  Tree Taper Table 149 for predicting stem diameters
   and volumes of stem sections.

 Table applies to P.RAD in WTRE             (forest(s)/region).

 Table based on data from WTRE.  Calculated in 1980

        Function used is :
d**2 = V/(K*H) * ( B1*X**1 + B2*X**2 + B3*X**3 + B4*X**4 +
          B5*X**5 + B6*X**B7 + B8*X**B9 )

 Coefficients:
       B1            B2            B3            B4            B5
 3.050200E-01  6.383800E+00 -7.874500E+00  3.321600E+00  0.000000E+00
       B6            B7            B8            B9            B10
 7.397500E-01  3.000000E+01  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  bias (cm)     std. error (cm)
                0.06          1.72

 Range of data:
     DBH (cm)          Height (m)        mean Volume (cubic m)
   min     max       min      max
     8      78        12       37                1.780

 A total of 210 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                        Mon Mar 09 13:42:32 1992
                        MOF Internal Copy (#001-67C7)


  Tree Taper Table 163 for predicting stem diameters
   and volumes of stem sections.

 Table applies to P.RAD in NGAU             (forest(s)/region).

 Table based on data from NGAU.  Calculated in 1984

        Function used is :
d**2 = V/(K*H) * ( B1*X**1 + B2*X**2 + B3*X**3 + B4*X**4 +
          B5*X**5 + B6*X**B7 + B8*X**B9 )

 Coefficients:
       B1           B2           B3           B4           B5
 1.688860E-01  5.412789E+00  -4.905432E+00  1.570605E+00  0.000000E+00
       B6           B7           B8           B9           B10
 9.177090E-01  3.800000E+01  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  bias (cm)      std. error (cm)
                0.06           1.67

 Range of data:
     DBH (cm)          Height (m)        mean Volume (cubic m)
   min     max       min      max
    16      75        10       41                1.790

 A total of 130 sectionally measured trees were used.



Log Assortment V4.02    TV250                        Mon Mar 09 13:42:48 1992
                        MOF Internal Copy (#001-67C7)


  Tree Taper Table 165 for predicting stem diameters
   and volumes of stem sections.

 Table applies to P.RAD in TIRU             (forest(s)/region).

 Table based on data from TAIRUA.  Calculated in 1983

        Function used is :
d**2 = V/(K*H) * ( B1*X**1 + B2*X**2 + B3*X**3 + B4*X**4 +
          B5*X**5 + B6*X**B7 + B8*X**B9 )

 Coefficients:
       B1           B2           B3           B4           B5
 1.204020E+00  2.506890E+00  -2.967260E+00  1.428860E+00  0.000000E+00
       B6           B7           B8           B9           B10
 5.704300E-01  3.000000E+01  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  bias (cm)      std. error (cm)
                0.04           2.42

 Range of data:
     DBH (cm)          Height (m)        mean Volume (cubic m)
   min     max       min      max
    12      95        12       52                2.110

 A total of 123 sectionally measured trees were used.
```

Log Assortment V4.02 TV250 Mon Mar 09 13:42:59 1992
MOF Internal Copy (#001-67C7)

Tree Taper Table 167 for predicting stem diameters and volumes of stem sections.

Table applies to P.RAD in LTAU 1000 THIN (forest(s)/region).

Table based on data from L.TAUPO. Calculated in 1982

Function used is :

```
d**2 = V/(K*H) * ( B1*X**1 + B2*X**2 + B3*X**3 + B4*X**4 +
         B5*X**5 + B6*X**B7 + B8*X**B9 )
```

Coefficients:

B1	B2	B3	B4	B5
8.879260E-01	1.917222E+00	0.000000E+00	0.000000E+00	-8.689500E-01
B6	**B7**	**B8**	**B9**	**B10**
1.050396E+00	1.600000E+01	0.000000E+00	0.000000E+00	0.000000E+00

Accuracy :	bias (cm)	std. error (cm)
	0.04	0.95

Range of data:

DBH (cm)		Height (m)		mean Volume (cubic m)
min	max	min	max	
11	30	10	22	0.240

A total of 102 sectionally measured trees were used.

Log Assortment V4.02 TV250 Mon Mar 09 13:43:09 1992
MOF Internal Copy (#001-67C7)

Tree Taper Table 169 for predicting stem diameters and volumes of stem sections.

Table applies to P.RAD in MOHA (forest(s)/region).

Table based on data from MOHAKA. Calculated in 1981

Function used is :

```
d**2 = V/(K*H) * ( B1*X**1 + B2*X**2 + B3*X**3 + B4*X**4 +
         B5*X**5 + B6*X**B7 + B8*X**B9 )
```

Coefficients:

B1	B2	B3	B4	B5
9.972300E-02	3.411600E+00	0.000000E+00	0.000000E+00	-1.492600E+00
B6	**B7**	**B8**	**B9**	**B10**
1.172400E+00	1.800000E+01	0.000000E+00	0.000000E+00	0.000000E+00

Accuracy :	bias (cm)	std. error (cm)
	0.10	1.50

Range of data:

DBH (cm)		Height (m)		mean Volume (cubic m)
min	max	min	max	
25	65	16	33	1.610

A total of 103 sectionally measured trees were used.

Log Assortment V4.02 TV250 Mon Mar 09 13:43:24 1992
MOF Internal Copy (#001-67C7)

Tree Taper Table 182 for predicting stem diameters
and volumes of stem sections.

Table applies to P.RAD in ALL NZ D.SAW LOG (forest(s)/region).

Table based on data from AKROWNNNSD. Calculated in 1980

Function used is :

```
d**2 = V/(K*H) * ( B1*X**1 + B2*X**2 + B3*X**3 + B4*X**4 +
       B5*X**5 + B6*X**B7 + B8*X**B9 )
```

Coefficients:

B1	B2	B3	B4	B5
5.547620E-01	0.000000E+00	1.238248E+01	-1.902890E+01	8.433540E+00
B6	**B7**	**B8**	**B9**	**B10**
8.700510E-01	3.100000E+01	0.000000E+00	0.000000E+00	0.000000E+00

Accuracy :	bias (cm)	std. error (cm)
	0.13	1.89

Range of data:

DBH (cm)		Height (m)		mean Volume (cubic m)
min	max	min	max	
32	78	23	46	2.200

A total of 244 sectionally measured trees were used.

Log Assortment V4.02 TV250 Mon Mar 09 13:43:39 1992
MOF Internal Copy (#001-67C7)

Tree Taper Table 183 for predicting stem diameters
and volumes of stem sections.

Table applies to P.RAD in WOOD (forest(s)/region).

Table based on data from WOODHILL. Calculated in 1982

Function used is :

```
d**2 = V/(K*H) * ( B1*X**1 + B2*X**2 + B3*X**3 + B4*X**4 +
       B5*X**5 + B6*X**B7 + B8*X**B9 )
```

Coefficients:

B1	B2	B3	B4	B5
-3.324000E-02	1.461146E+01	-3.882100E+01	4.472911E+01	-1.881004E+01
B6	**B7**	**B8**	**B9**	**B10**
1.014175E+00	2.400000E+01	0.000000E+00	0.000000E+00	0.000000E+00

Accuracy :	bias (cm)	std. error (cm)
	0.07	1.76

Range of data:

DBH (cm)		Height (m)		mean Volume (cubic m)
min	max	min	max	
33	69	25	40	2.530

A total of 126 sectionally measured trees were used.

```
Log Assortment V4.02    TV250                        Mon Mar 09 13:43:51 1992
                        MOF Internal Copy (#001-67C7)

  Tree Taper Table 188 for predicting stem diameters
   and volumes of stem sections.

 Table applies to P.RAD in WUKU              (forest(s)/region).

 Table based on data from WAIUKU.  Calculated in 1983

        Function used is :
d**2 = V/(K*H) * ( B1*X**1 + B2*X**2 + B3*X**3 + B4*X**4 +
          B5*X**5 + B6*X**B7 + B8*X**B9 )

 Coefficients:
       B1            B2            B3            B4            B5
 7.924000E-01  8.171600E+00  -2.184100E+01  2.609320E+01  -1.149670E+01
       B6            B7            B8            B9            B10
 9.409000E-01  2.400000E+01  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  bias (cm)      std. error (cm)
               0.09           1.87

 Range of data:
     DBH (cm)          Height (m)        mean Volume (cubic m)
   min     max       min      max
    30      65        24       40               2.030

 A total of 101 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                        Mon Mar 09 13:44:02 1992
                        MOF Internal Copy (#001-67C7)

  Tree Taper Table 196 for predicting stem diameters
   and volumes of stem sections.

 Table applies to P.RAD in ROEU              (forest(s)/region).

 Table based on data from ROTOEHU.  Calculated in 1983

        Function used is :
d**2 = V/(K*H) * ( B1*X**1 + B2*X**2 + B3*X**3 + B4*X**4 +
          B5*X**5 + B6*X**B7 + B8*X**B9 )

 Coefficients:
       B1            B2            B3            B4            B5
 4.870000E-01  3.748000E+00  -2.078000E+00  0.000000E+00  0.000000E+00
       B6            B7            B8            B9            B10
 1.092000E+00  4.000000E+01  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  bias (cm)      std. error (cm)
               0.20           1.87

 Range of data:
     DBH (cm)          Height (m)        mean Volume (cubic m)
   min     max       min      max
    37      76        36       50               2.980

 A total of 100 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                        Mon Mar 09 13:44:10 1992
                        MOF Internal Copy (#001-67C7)


  Tree Taper Table 205 for predicting stem diameters
   and volumes of stem sections.

 Table applies to P.RAD in WOOD O/C 2 THIN  (forest(s)/region).

 Table based on data from WOODHILL.  Calculated in 1983

        Function used is :
d**2 = V/(K*H) * ( B1*X**1 + B2*X**2 + B3*X**3 + B4*X**4 +
          B5*X**5 + B6*X**B7 + B8*X**B9 )

 Coefficients:
       B1           B2           B3           B4           B5
 2.249600E-01 9.350500E+00 -2.152600E+01 2.403900E+01 -1.022600E+01
       B6           B7           B8           B9           B10
 9.256400E-01 1.800000E+01 0.000000E+00 0.000000E+00 0.000000E+00

 Accuracy :  bias (cm)     std. error (cm)
                0.07          1.16

 Range of data:
     DBH (cm)          Height (m)        mean Volume (cubic m)
   min     max       min      max
    17      50        17       35                0.860

 A total of 97 sectionally measured trees were used.
```

```
Log Assortment V4.02    TV250                        Mon Mar 09 13:44:22 1992
                        MOF Internal Copy (#001-67C7)


  Tree Taper Table 206 for predicting stem diameters
   and volumes of stem sections.

 Table applies to P.RAD in MARM 2 CROP      (forest(s)/region).

 Table based on data from MARAHARUA.  Calculated in 1984

        Function used is :
d**2 = V/(K*H) * ( B1*X**1 + B2*X**2 + B3*X**3 + B4*X**4 +
          B5*X**5 + B6*X**B7 + B8*X**B9 )

 Coefficients:
       B1           B2           B3           B4           B5
 5.632460E-01 7.349418E+00 -1.714856E+01 2.000829E+01 -8.851640E+00
       B6           B7           B8           B9           B10
 1.026515E+00 3.400000E+01 0.000000E+00 0.000000E+00 0.000000E+00

 Accuracy :  bias (cm)     std. error (cm)
                0.11          1.67

 Range of data:
     DBH (cm)          Height (m)        mean Volume (cubic m)
   min     max       min      max
    10      82        16       42                1.920

 A total of 101 sectionally measured trees were used.
```

Log Assortment V4.02 TV250 Mon Mar 09 13:44:31 1992
MOF Internal Copy (#001-67C7)

Tree Taper Table 212 for predicting stem diameters
and volumes of stem sections.

Table applies to P.RAD in SANTOFT (forest(s)/region).

Table based on data from SANTOFT. Calculated in 1984

Function used is :

$$d^{**}2 = V/(K*H) * (B1*X^{**}1 + B2*X^{**}2 + B3*X^{**}3 + B4*X^{**}4 + B5*X^{**}5 + B6*X^{**}B7 + B8*X^{**}B9)$$

Coefficients:

B1	B2	B3	B4	B5
4.816200E-02	6.578364E+00	-5.961504E+00	0.000000E+00	1.461468E+00
B6	**B7**	**B8**	**B9**	**B10**
8.679410E-01	2.800000E+01	0.000000E+00	0.000000E+00	0.000000E+00

Accuracy : bias (cm) std. error (cm)
0.10 1.20

Range of data:

DBH (cm)		Height (m)		mean Volume (cubic m)
min	max	min	max	
16	57	11	37	1.200

A total of 94 sectionally measured trees were used.

Log Assortment V4.02 TV250 Mon Mar 09 13:44:40 1992
MOF Internal Copy (#001-67C7)

Tree Taper Table 214 for predicting stem diameters
and volumes of stem sections.

Table applies to P.RAD in MGAT 250-320 sph (forest(s)/region).

Table based on data from MANGATU. Calculated in 1984

Function used is :

$$d^{**}2 = V/(K*H) * (B1*X^{**}1 + B2*X^{**}2 + B3*X^{**}3 + B4*X^{**}4 + B5*X^{**}5 + B6*X^{**}B7 + B8*X^{**}B9)$$

Coefficients:

B1	B2	B3	B4	B5
3.570100E-01	4.036407E+00	-2.175936E+00	0.000000E+00	0.000000E+00
B6	**B7**	**B8**	**B9**	**B10**
7.403700E-01	3.600000E+01	0.000000E+00	0.000000E+00	0.000000E+00

Accuracy : bias (cm) std. error (cm)
0.11 1.51

Range of data:

DBH (cm)		Height (m)		mean Volume (cubic m)
min	max	min	max	
35	64	24	39	2.130

A total of 104 sectionally measured trees were used.

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:44:49 1992
                        MOF Internal Copy (#001-67C7)


  Tree Taper Table 218 for predicting stem diameters
   and volumes of stem sections.

 Table applies to P.RAD in MGAT 450 sph     (forest(s)/region).

 Table based on data from Mangatu.  Calculated in 1985

        Function used is :
d**2 = V/(K*H) * ( B1*X**1 + B2*X**2 + B3*X**3 + B4*X**4 +
          B5*X**5 + B6*X**B7 + B8*X**B9 )

 Coefficients:
       B1            B2            B3            B4            B5
 5.384000E-02  6.855000E+00  -1.020000E+01  8.850000E+00  -3.306000E+00
       B6            B7            B8            B9            B10
 7.822800E-01  4.000000E+01  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  bias (cm)      std. error (cm)
                0.07            1.35

 Range of data:
     DBH (cm)          Height (m)        mean Volume (cubic m)
   min     max       min      max
    28      66        24       43                1.830

 A total of 104 sectionally measured trees were used.



Log Assortment V4.02    TV250                          Mon Mar 09 13:44:57 1992
                        MOF Internal Copy (#001-67C7)


  Tree Taper Table 224 for predicting stem diameters
   and volumes of stem sections.

 Table applies to P.RAD in LISM ages 7-22   (forest(s)/region).

 Table based on data from Lismore.  Calculated in 1985

        Function used is :
d**2 = V/(K*H) * ( B1*X**1 + B2*X**2 + B3*X**3 + B4*X**4 +
          B5*X**5 + B6*X**B7 + B8*X**B9 )

 Coefficients:
       B1            B2            B3            B4            B5
 5.717000E-02  4.215000E+00  0.000000E+00  -3.760000E+00  1.788000E+00
       B6            B7            B8            B9            B10
 8.371000E-01  4.000000E+01  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  bias (cm)      std. error (cm)
                0.05            1.25

 Range of data:
     DBH (cm)          Height (m)        mean Volume (cubic m)
   min     max       min      max
    16      60         8       36                1.470

 A total of 111 sectionally measured trees were used.
```

Log Assortment V4.02 TV250 Mon Mar 09 13:45:09 1992
MOF Internal Copy (#001-67C7)

Tree Taper Table 227 for predicting stem diameters and volumes of stem sections.

Table applies to P.RAD in POMA 500sph ag30 (forest(s)/region).

Table based on data from Pukerau Blk.. Calculated in 1986

Function used is :

$$d^{**}2 = V/(K*H) * (B1*X^{**}1 + B2*X^{**}2 + B3*X^{**}3 + B4*X^{**}4 + B5*X^{**}5 + B6*X^{**}B7 + B8*X^{**}B9)$$

Coefficients:

B1	B2	B3	B4	B5
2.915000E-01	6.414000E+00	-7.984000E+00	3.440000E+00	0.000000E+00
B6	**B7**	**B8**	**B9**	**B10**
5.559600E-01	4.000000E+01	9.727900E-01	9.000000E+01	0.000000E+00

Accuracy : bias (cm) std. error (cm)
0.13 1.50

Range of data:

DBH (cm)		Height (m)		mean Volume (cubic m)
min	max	min	max	
37	65	28	38	2.290

A total of 87 sectionally measured trees were used.

Log Assortment V4.02 TV250 Mon Mar 09 13:45:17 1992
MOF Internal Copy (#001-67C7)

Tree Taper Table 230 for predicting stem diameters and volumes of stem sections.

Table applies to P.RAD in GDNS ages 26-30 (forest(s)/region).

Table based on data from Long Gully. Calculated in 1986

Function used is :

$$d^{**}2 = V/(K*H) * (B1*X^{**}1 + B2*X^{**}2 + B3*X^{**}3 + B4*X^{**}4 + B5*X^{**}5 + B6*X^{**}87 + B8*X^{**}B9)$$

Coefficients:

B1	B2	B3	B4	B5
1.602560E-01	5.149200E+00	-3.547600E+00	0.000000E+00	0.000000E+00
B6	**B7**	**B8**	**B9**	**B10**
7.517700E-01	8.000000E+00	4.857820E-01	7.000000E+01	0.000000E+00

Accuracy : bias (cm) std. error (cm)
0.11 1.14

Range of data:

DBH (cm)		Height (m)		mean Volume (cubic m)
min	max	min	max	
16	62	19	43	1.590

A total of 92 sectionally measured trees were used.

Log Assortment V4.02 TV250 Mon Mar 09 13:45:29 1992
MOF Internal Copy (#001-67C7)

Tree Taper Table 231 for predicting stem diameters
and volumes of stem sections.

Table applies to P.RAD in TEWR ages 9-31 (forest(s)/region).

Table based on data from Te Wera. Calculated in 1986

Function used is :

$$d^2 = V/(K*H) * (B1*X^1 + B2*X^2 + B3*X^3 + B4*X^4 + B5*X^5 + B6*X^{B7} + B8*X^{B9})$$

Coefficients:

B1	B2	B3	B4	B5
4.130000E-02	5.550000E+00	-4.144000E+00	0.000000E+00	9.276000E-01
B6	**B7**	**B8**	**B9**	**B10**
6.554000E-01	6.000000E+01	0.000000E+00	0.000000E+00	0.000000E+00

Accuracy :	bias (cm)	std. error (cm)
	0.08	1.71

Range of data:

DBH (cm)		Height (m)		mean Volume (cubic m)
min	max	min	max	
20	70	14	50	2.650

A total of 103 sectionally measured trees were used.

Log Assortment V4.02 TV250 Mon Mar 09 13:45:35 1992
MOF Internal Copy (#001-67C7)

Tree Taper Table 232 for predicting stem diameters
and volumes of stem sections.

Table applies to P.RAD in LONG ages 14-24 (forest(s)/region).

Table based on data from Woodlaw Blk. Calculated in 1986

Function used is :

$$d^2 = V/(K*H) * (B1*X^1 + B2*X^2 + B3*X^3 + B4*X^4 + B5*X^5 + B6*X^{B7} + B8*X^{B9})$$

Coefficients:

B1	B2	B3	B4	B5
9.874800E-01	0.000000E+00	8.004000E+00	-1.425000E+01	8.076000E+00
B6	**B7**	**B8**	**B9**	**B10**
8.426600E-01	9.000000E+01	0.000000E+00	0.000000E+00	0.000000E+00

Accuracy :	bias (cm)	std. error (cm)
	0.06	0.83

Range of data:

DBH (cm)		Height (m)		mean Volume (cubic m)
min	max	min	max	
9	32	7	19	0.180

A total of 105 sectionally measured trees were used.

```
Log Assortment V4.02    TV250                          Mon Mar 09 13:45:44 1992
                        MOF Internal Copy (#001-67C7)


  Tree Taper Table 235 for predicting stem diameters
   and volumes of stem sections.

 Table applies to P.RAD in LONG age30sph370 (forest(s)/region).

 Table based on data from LONG Cpt29.  Calculated in 1986

        Function used is :
d**2 = V/(K*H) * ( B1*X**1 + B2*X**2 + B3*X**3 + B4*X**4 +
          B5*X**5 + B6*X**B7 + B8*X**B9 )

 Coefficients:
       B1            B2            B3            B4            B5
 5.958000E-01  3.641400E+00  -2.157200E+00  0.000000E+00  0.000000E+00
       B6            B7            B8            B9            B10
 1.681400E+00  6.000000E+01  0.000000E+00  0.000000E+00  0.000000E+00

 Accuracy :  bias (cm)     std. error (cm)
                0.14           1.55

 Range of data:
     DBH (cm)          Height (m)        mean Volume (cubic m)
   min     max       min      max
    30      67        27       39               2.260

 A total of 96 sectionally measured trees were used.




Log Assortment V4.02    TV250                          Mon Mar 09 13:45:52 1992
                        MOF Internal Copy (#001-67C7)


  Tree Taper Table 236 for predicting stem diameters
   and volumes of stem sections.

 Table applies to P.RAD in WOOD 370sph      (forest(s)/region).

 Table based on data from WOOD Cpt67,6.  Calculated in 1986

        Function used is :
d**2 = V/(K*H) * ( B1*X**1 + B2*X**2 + B3*X**3 + B4*X**4 +
          B5*X**5 + B6*X**B7 + B8*X**B9 )

 Coefficients:
       B1            B2            B3            B4            B5
 5.339500E-01  5.244000E+00  -5.448000E+00  0.000000E+00  1.965000E+00
       B6            B7            B8            B9            B10
 4.700900E-01  2.800000E+01  3.016650E-01  9.000000E+01  0.000000E+00

 Accuracy :  bias (cm)     std. error (cm)
                0.13           1.54

 Range of data:
     DBH (cm)          Height (m)        mean Volume (cubic m)
   min     max       min      max
    20      63        25       37               1.470

 A total of 121 sectionally measured trees were used.
```

Log Assortment V4.02 TV250 Mon Mar 09 13:46:06 1992
MOF Internal Copy (#001-67C7)

Tree Taper Table 237 for predicting stem diameters and volumes of stem sections.

Table applies to P.RAD in KANG Trans. crop (forest(s)/region).

Table based on data from KANG . Calculated in 1987

Function used is :

```
d**2 = V/(K*H) * ( B1*X**1 + B2*X**2 + B3*X**3 + B4*X**4 +
         B5*X**5 + B6*X**B7 + B8*X**B9 )
```

Coefficients:

B1	B2	B3	B4	B5
4.154100E-01	5.559000E+00	-5.728000E+00	0.000000E+00	2.169600E+00
B6	**B7**	**B8**	**B9**	**B10**
8.822450E-01	9.000000E+01	0.000000E+00	0.000000E+00	0.000000E+00

Accuracy : bias (cm) std. error (cm)
0.11 1.44

Range of data:

DBH (cm)		Height (m)		mean Volume (cubic m)
min	max	min	max	
28	69	32	49	2.460

A total of 88 sectionally measured trees were used.

5. SIMULATION DETAILS

A/ Direct Regime

```
GroStand V4.14                                        Sun Feb 23 18:21:17 1992
                FRI MoF >>> Internal Use Only <<< (#006-97C7)


     Growth Model    : 23 EARLY   Run Name        : TV250
     Medium fert.  Beekhuis crn.fn.  BA adj  0.0%  DOS adj  0.0cm
     Height Model    : 34         Site Index      : 27.0
     Stand Volume    : 29         Start Date      : 1994 Jul ( 4.0)
     Monthly Growth :  1          Mean Top Height :  4.2


     Growth Model    : 22 PPM88   Run Name        : TV250
     Height Model    : 34         Site Index      : 27.0
     Stand Volume    : 29         Start Date      : 1994 Jul ( 4.0)
     Monthly Growth :  1          Mean Top Height :  4.2


                              STANDING YIELD
                              --------------

Age  MeanTopHt BasalArea Stocking MeanDBH
 yrs      m      sq.m/ha  stems/ha    cm
 4.0      4.2      1.63       800     5.1
 5.2      5.9      6.31       800    10.0
>>  PRUNED (DOS) 450 stems/ha to  2.2 m.
 5.2      5.9      6.31       800    10.0
>>  THINNED stand (least prnd) to waste leaving 450 stems/ha
 5.2      5.9      3.95       450    10.6
 6.3      7.5      7.04       450    14.1
>>  PRUNED (DOS) 350 stems/ha to  4.2 m.
 6.3      7.5      7.04       450    14.1
 7.3      9.0      9.47       450    16.4
 8.2     10.3     12.25       450    18.6
>>  PRUNED (DOS) 250 stems/ha to  6.2 m.
 8.2     10.3     12.25       450    18.6
>>  THINNED stand (least prnd) to waste leaving 250 stems/ha
 8.2     10.3      6.79       250    18.6
 9.0     11.5      8.07       250    20.3
>>  SWITCHED to later model set from G23 H34 V29 M1

Age  MeanTopHt BasalArea Stocking MeanDBH
 yrs      m      sq.m/ha  stems/ha    cm
 9.0     11.5      8.07       250    20.3
10.0     13.0     11.05       250    23.7
11.0     14.5     14.07       250    26.8
12.0     16.0     17.00       250    29.4
13.0     17.5     19.78       250    31.8
14.0     18.9     22.41       250    33.8
15.0     20.3     24.89       249    35.6
16.0     21.7     27.23       249    37.3
17.0     23.1     29.46       249    38.8
18.0     24.4     31.57       249    40.2
19.0     25.7     33.58       249    41.5
20.0     27.0     35.49       248    42.7
21.0     28.2     37.32       248    43.8
22.0     29.4     39.07       248    44.8
23.0     30.6     40.75       248    45.8
24.0     31.8     42.35       247    46.7
25.0     32.9     43.89       247    47.6
26.0     34.0     45.37       247    48.4
```

26.0	34.0	45.37	247	48.4
27.0	35.0	46.79	246	49.2
28.0	36.0	48.15	246	49.9
29.0	37.0	49.47	246	50.6
30.0	38.0	50.74	245	51.3
31.0	38.9	51.96	245	52.0
32.0	39.8	53.14	244	52.6
33.0	40.7	54.28	244	53.2
34.0	41.5	55.38	244	53.8
35.0	42.3	56.44	243	54.3
36.0	43.1	57.46	243	54.9
37.0	43.9	58.45	242	55.4
38.0	44.6	59.41	242	55.9
39.0	45.3	60.34	242	56.4
40.0	46.0	61.24	241	56.9

>> END Rotation

REMOVED YIELD

Date Year	Month	Stocking stems/ha	BasalArea sq.m/ha	MeanDBH cm	Volume cu.m/ha
1995	Sep	350	2.36	9.3	6
1998	Sep	200	5.46	18.6	21

>> Switched to later model set from G23 H34 V29 M1

PRUNING DETAILS

Date 1995 SEP Age 5.2 Pruning (DOS) to 2.2 m
PrunHt 2.2 m MeanTopHt 5.9 m Stocking 450 stems/ha
CrownHt 2.2 m MeanHt 5.4 m
DOSHt 0.8 m MaxBr 3.9 cm
DOS 16.6 cm Crop DOS 16.8 cm Calip 9.2 cm

Date 1996 OCT Age 6.3 Pruning (DOS) to 4.2 m
PrunHt 4.2 m MeanTopHt 7.5 m Stocking 350 stems/ha
CrownHt 4.2 m MeanHt 6.9 m
DOSHt 2.4 m MaxBr 4.3 cm
DOS 16.3 cm Crop DOS 16.5 cm Calip 7.8 cm

Date 1998 SEP Age 8.2 Pruning (DOS) to 6.2 m
PrunHt 6.2 m MeanTopHt 10.3 m Stocking 250 stems/ha
CrownHt 6.2 m MeanHt 9.8 m
DOSHt 4.4 m MaxBr 4.5 cm
DOS 16.7 cm Crop DOS 16.7 cm Calip 8.6 cm

DDIST V4.03 TV250 Sun Feb 23 17:29:01 1992
MOF Internal Copy (#001-47C7)

STAND OVERVIEW

Age 30.0 Mean top Height 38.0 Stocking 245.2 sph Basal Area 50.74
Potential Productive Area Stocked 100.0% Area Lost on thinning 0.0%
Values adjusted for area losses : Stocking 245.2 sph Basal Area 50.74

	DBH (cm)	25.0+	30.0+	35.0+	40.0+	45.0+	50.0+	55.0+	60.0+	65.0+	70.0+	75.0+	80.0+
	sph	0.5	10.9	25.7	39.0	46.5	45.2	36.0	23.2	11.8	4.7	1.4	0.3
Height	m	29.5	31.6	33.3	34.6	35.8	36.7	37.6	38.3	38.9	39.5	40.0	40.4

Log Assortment V4.02 TV250 Sun Feb 23 17:36:12 1992
MOF Internal Copy (#001-67C7)

LOG SUMMARY

REMOVAL 1 Age 30.0 Clearfell STAND ELEMENT 4.

Log Cutting Pattern - NZ DOMESTIC.
Cutting strategy is preferential.
Stump height 0.3 m Malformation loss 3.0 %

Log Specification	Pruned / Unpruned	Length (m) Min	Max	Min. SED (mm)	Max. Logs
1	P	2.6	6.4	300	1
2	U	5.5	5.5	100	99
3	U	3.7	5.4	100	99

Log Summary by log specification

Log Specification	Volume (m^3/ha)	Number of logs(/ha)
3	24.1	258.2
2	367.4	920.6
1	196.9	233.8
Total	588.5	1412.5

Log Grading Model V4.07 TV250 Sun Feb 23 17:36:31 1992
FRI MoF >>> Internal Use Only <<< (#002-97C7)

Log Grade Specifications used : "NZDON"

Log Grades	% downgraded to lowest grade	% downgraded to waste
Pruned	0	0
Unpruned	0	0

LOG VARIABLES BY LOG GRADE :

Clearfelling, Age 30.0

GRADE	VOLUME (m3)	SED (mm)	LENGTH (m)	TAPER (mm/m)	SWEEP (mm/m)	BIX (cm)	MBD (kg/m3)	IIX	MAXDC (mm)	MEANDC (mm)	MAXBR (cm)
PR1	181.5	421	5.9	11	7	0.0	424	0.25	241	220	4.5
PR2	0.0	0	0.0	0	0	0.0	0	0.00	0	0	0.0
PR3	0.0	0	0.0	0	0	0.0	0	0.00	0	0	0.0
S1	7.6	437	5.5	10	4	4.9	409	0.34	0	0	0.0
S2	42.8	347	5.5	9	4	4.8	406	0.31	0	0	0.0
S3	51.9	264	5.5	8	4	4.5	405	0.27	0	0	0.0
S4	13.5	180	5.3	11	3	4.7	389	0.22	0	0	0.0
L1	35.5	444	5.5	10	4	7.1	408	0.33	0	0	0.0
L2	117.5	348	5.5	10	4	7.0	401	0.27	0	0	0.0
L3	70.5	256	5.5	10	4	6.9	393	0.23	0	0	0.0
L4	23.1	184	5.2	13	3	6.8	388	0.22	0	0	0.0
PULP	40.8	232	5.4	13	14	5.6	399	0.23	0	0	0.0
Total	584.7										

Waste	0.0										

B/ Framing Regime

GroStand V4.14 Sun Feb 23 17:30:38 1992
FRI MoF >>> Internal Use Only <<< (#006-97C7)

Growth Model	: 22 PPM88	Run Name	: TV400
Height Model	: 34	Site Index	: 27.0
Stand Volume	: 29	Start Date	: 1994 Jul (4.0)
Monthly Growth	: 1	Mean Top Height	: 4.2

STANDING YIELD

Age	MeanTopHt	BasalArea	Stocking	MeanDBH
yrs	m	sq.m/ha	stems/ha	cm
4.0	4.2	3.37	1650	5.1
5.0	5.6	7.12	1649	7.4
6.0	7.0	11.41	1643	9.4
7.0	8.5	16.04	1633	11.2
8.0	10.0	20.69	1621	12.7
9.0	11.5	25.10	1607	14.1
9.9	13.0	29.21	1592	15.3
>> THINNED stand (below) to waste leaving 400 stems/ha				
9.9	13.0	9.16	399	17.1
10.0	13.0	9.16	399	17.1
11.0	14.5	11.82	399	19.4
12.0	16.0	14.79	399	21.7
13.0	17.5	17.87	398	23.9
14.0	18.9	20.87	398	25.8
15.0	20.3	23.75	397	27.6
16.0	21.7	26.48	397	29.2
17.0	23.1	29.08	396	30.6
18.0	24.4	31.54	395	31.9
19.0	25.7	33.88	394	33.1
20.0	27.0	36.12	394	34.2
21.0	28.2	38.25	393	35.2
22.0	29.4	40.29	392	36.2
23.0	30.6	42.24	391	37.1
24.0	31.8	44.11	390	37.9
25.0	32.9	45.90	389	38.8
26.0	33.9	47.62	388	39.5
27.0	35.0	49.27	387	40.3
28.0	36.0	50.86	386	41.0
29.0	37.0	52.38	385	41.6
30.0	38.0	53.85	384	42.3
31.0	38.9	55.27	383	42.9
32.0	39.8	56.63	381	43.5
33.0	40.7	57.95	380	44.1
34.0	41.5	59.22	379	44.6
35.0	42.3	60.44	378	45.1
36.0	43.1	61.63	376	45.7
37.0	43.9	62.77	375	46.2
38.0	44.6	63.87	374	46.6
39.0	45.3	64.94	373	47.1
40.0	46.0	65.97	371	47.6
>> END Rotation				

REMOVED YIELD

Date Year	Month	Stocking stems/ha	BasalArea sq.m/ha	MeanDBH cm	Volume cu.m/ha
2000	Jun	1193	20.05	14.6	97

PRUNING DETAILS

NIL

DDIST V4.03 TV400 Sun Feb 23 17:31:08 1992
MOF Internal Copy (#001-47C7)

STAND OVERVIEW

Age 30.0 Mean top Height 38.0 Stocking 383.7 sph Basal Area 53.85
Potential Productive Area Stocked 100.0% Area Lost on thinning 0.0%
Values adjusted for area losses : Stocking 383.7 sph Basal Area 53.85

DBH (cm)	15.0+	20.0+	25.0+	30.0+	35.0+	40.0+	45.0+	50.0+	55.0+	60.0+	65.0+	70.0+	75.0+
sph	0.5	21.4	43.1	58.9	66.2	63.4	52.3	36.9	22.3	11.4	4.9	1.7	0.5
Height m	24.5	27.9	30.5	32.6	34.2	35.5	36.6	37.5	38.3	39.0	39.6	40.1	40.6

Log Assortment V4.02 TV400 Sun Feb 23 17:38:00 1992
MOF Internal Copy (#001-67C7)

LOG SUMMARY

REMOVAL 1 Age 30.0 Clearfell STAND ELEMENT 1.

Log Cutting Pattern - NZ DOMESTIC.
Cutting strategy is preferential.
Stump height 0.3 m Malformation loss 3.0 %

Log Specification	Pruned / Unpruned	Length (m) Min	Max	Min. SED (mm)	Max. Logs
1	P	2.6	6.4	300	1
2	U	5.5	5.5	100	99
3	U	3.7	5.4	100	99

Log Summary by log specification

Log Specification	Volume (m^3/ha)	Number of logs(/ha)
3	27.2	381.9
2	603.7	1681.9
Total	630.9	2063.9

Log Grading Model V4.07 TV400 Sun Feb 23 17:38:27 1992
FRI MoF >>> Internal Use Only <<< (#002-97C7)

Log Grade Specifications used : "NZDOM"

Log Grades	% downgraded to lowest grade	% downgraded to waste
Pruned	0	0
Unpruned	0	0

LOG VARIABLES BY LOG GRADE :

Clearfelling, Age 30.0

GRADE	VOLUME (m3)	SED (mm)	LENGTH (m)	TAPER (mm/m)	SWEEP (mm/m)	BIX (cm)	MBD (kg/m3)	IIX	MAXDC (mm)	MEANDC (mm)	MAXBR (cm)
PR1	0.0	0	0.0	0	0	0.0	0	0.00	0	0	0.0
PR2	0.0	0	0.0	0	0	0.0	0	0.00	0	0	0.0
PR3	0.0	0	0.0	0	0	0.0	0	0.00	0	0	0.0
S1	82.0	444	5.5	12	6	4.2	422	0.26	0	0	0.0
S2	182.2	344	5.5	9	5	3.9	416	0.28	0	0	0.0
S3	184.6	255	5.5	8	4	3.9	404	0.27	0	0	0.0
S4	56.9	176	5.3	9	3	3.7	397	0.24	0	0	0.0
L1	12.6	451	5.5	11	5	6.2	411	0.29	0	0	0.0
L2	25.7	348	5.5	9	4	6.2	400	0.25	0	0	0.0
L3	20.8	257	5.5	11	4	6.2	391	0.22	0	0	0.0
L4	4.5	180	5.1	14	3	6.2	388	0.22	0	0	0.0
PULP	55.8	189	5.3	10	13	3.8	399	0.23	0	0	0.0
Total	625.2										

Waste	0.0										

C/ Unthinned Regime

GroStand V4.14 Sun Feb 23 17:32:24 1992
FRI MoF >>> Internal Use Only <<< (#006-97C7)

Growth Model : 22 PPM88 Run Name : TVUT
Height Model : 34 Site Index : 27.0
Stand Volume : 29 Start Date : 1994 Jul (4.0)
Monthly Growth : 1 Mean Top Height : 4.2

STANDING YIELD

Age yrs	MeanTopHt m	BasalArea sq.m/ha	Stocking stems/ha	MeanDBH cm
4.0	4.2	3.37	1650	5.1
5.0	5.6	7.12	1649	7.4
6.0	7.0	11.41	1643	9.4
7.0	8.5	16.04	1633	11.2
8.0	10.0	20.69	1621	12.7
9.0	11.5	25.10	1607	14.1
10.0	13.0	29.21	1592	15.3
11.0	14.5	33.02	1576	16.3
12.0	16.0	36.57	1559	17.3
13.0	17.5	39.87	1542	18.1
14.0	18.9	42.96	1525	18.9
15.0	20.3	45.86	1507	19.7
16.0	21.7	48.59	1488	20.4
17.0	23.1	51.17	1469	21.1
18.0	24.4	53.60	1451	21.7
19.0	25.7	55.91	1431	22.3
20.0	27.0	58.10	1412	22.9
21.0	28.2	60.19	1393	23.5
22.0	29.4	62.17	1374	24.0
23.0	30.6	64.06	1355	24.5
24.0	31.8	65.86	1335	25.1
25.0	32.9	67.57	1316	25.6
26.0	33.9	69.21	1297	26.1
27.0	35.0	70.78	1279	26.5
28.0	36.0	72.28	1260	27.0
29.0	37.0	73.72	1242	27.5
30.0	38.0	75.09	1224	28.0
31.0	38.9	76.41	1206	28.4
32.0	39.8	77.67	1188	28.9
33.0	40.7	78.89	1170	29.3
34.0	41.5	80.05	1153	29.7
35.0	42.3	81.16	1136	30.2
36.0	43.1	82.23	1120	30.6
37.0	43.9	83.26	1103	31.0
38.0	44.6	84.25	1087	31.4
39.0	45.3	85.20	1072	31.8
40.0	46.0	86.11	1056	32.2

>> END Rotation

REMOVED YIELD

Date Year	Month	Stocking stems/ha	BasalArea sq.m/ha	MeanDBH cm	Volume cu.m/ha

PRUNING DETAILS

NIL

DDIST V4.03 TVUT Sun Feb 23 17:32:53 1992
MOF Internal Copy (#001-47C7)

STAND OVERVIEW

Age 30.0 Mean top Height 38.0 Stocking 1223.6 sph Basal Area 75.09
Potential Productive Area Stocked 100.0% Area Lost on thinning 0.0%
Values adjusted for area losses : Stocking 1223.6 sph Basal Area 75.09

DBH (cm)	0.0+	5.0+	10.0+	15.0+	20.0+	25.0+	30.0+	35.0+	40.0+	45.0+	50.0+	55.0+	60.0+
sph	2.0	107.1	164.3	193.9	194.8	173.0	138.2	100.2	66.4	40.3	22.5	11.5	5.5
Height m	6.1	14.3	20.9	25.6	29.0	31.5	33.5	35.0	36.3	37.3	38.2	38.9	39.6

DBH (cm)	65.0+	70.0+	75.0+	80.0+
sph	2.4	1.0	0.4	0.1
Height m	40.2	40.6	41.1	41.5

Log Assortment V4.02 TVUT Sun Feb 23 17:39:36 1992
MOF Internal Copy (#001-67C7)

LOG SUMMARY

REMOVAL 1 Age 30.0 Clearfell STAND ELEMENT 1.

Log Cutting Pattern - NZ DOMESTIC.
Cutting strategy is preferential.
Stump height 0.3 m Malformation loss 3.0 %

Log Specification	Pruned / Unpruned	Length (m) Min	Length (m) Max	Min. SED (mm)	Max. Logs
1	P	2.6	6.4	300	1
2	U	5.5	5.5	100	99
3	U	3.7	5.4	100	99

Log Summary by log specification

Log Specification	Volume (m^3/ha)	Number of logs(/ha)
3	89.6	1360.5
2	756.2	2954.4
Total	845.7	4314.9

Log Grading Model V4.07 TV400 Sun Feb 23 17:38:27 1992
FRI MoF >>> Internal Use Only <<< (#002-97C7)

Log Grade Specifications used : "NZDOM"

Log Grades	% downgraded to lowest grade	% downgraded to waste
Pruned	0	0
Unpruned	0	0

LOG VARIABLES BY LOG GRADE :

Clearfelling, Age 30.0

GRADE	VOLUME (m3)	SED (mm)	LENGTH (m)	TAPER (mm/m)	SWEEP (mm/m)	BIX (cm)	MBD (kg/m3)	IIX	MAXDC (mm)	MEANDC (mm)	MAXBR (cm)
PR1	0.0	0	0.0	0	0	0.0	0	0.00	0	0	0.0
PR2	0.0	0	0.0	0	0	0.0	0	0.00	0	0	0.0
PR3	0.0	0	0.0	0	0	0.0	0	0.00	0	0	0.0
S1	82.0	444	5.5	12	6	4.2	422	0.26	0	0	0.0
S2	182.2	344	5.5	9	5	3.9	416	0.28	0	0	0.0
S3	184.6	255	5.5	8	4	3.9	404	0.27	0	0	0.0
S4	56.9	176	5.3	9	3	3.7	397	0.24	0	0	0.0
L1	12.6	451	5.5	11	5	6.2	411	0.29	0	0	0.0
L2	25.7	348	5.5	9	4	6.2	400	0.25	0	0	0.0
L3	20.8	257	5.5	11	4	6.2	391	0.22	0	0	0.0
L4	4.5	180	5.1	14	3	6.2	388	0.22	0	0	0.0
PULP	55.8	189	5.3	10	13	3.8	399	0.23	0	0	0.0
Total	625.2										
Waste	0.0										