


PRODUCTION FORESTRY RESEARCH COOPERATIVE

MANAGEMENT OF EUCALYPTUS SPECIES

FOREST MANAGEMENT AND RESOURCES DIVISION
FOREST RESEARCH INSTITUTE
PRIVATE BAG
ROTORUA

DATA FROM THE EUCALYPTUS REGNANS
REGIMES TRIAL , MURUPARA
1982 - 1986

B.M.P.KAMPFRAATH

REPORT NO. 2

MARCH 1987

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NOTE : Confidential to participants of the management of
Eucalyptus species cooperative.

: This material is unpublished and must not be cited
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DATA FROM E. REGNANS REGIMES TRIAL

This trial was planted between the 28th to 31st of August 1978 by the Murupara Womens' gang. It is located in compartments 1209 and 1210 of the Murupara subdivision of Kaingaroa Forest. The registered plot number is R01980. Seedlings were 1/0 bare rooted seedlings raised in the FRI nursery from seed which originated in Franklin, Tasmania (approximately 350 m.a.s.l.). The site had previously been occupied by P. radiata planted 1931 and logged in 1977 and 1978. Site preparation before planting included an overspraying with a mixture of Amitral/Atrazine and Simazine.

The experiment is laid out in three blocks adjacent to each other. Within each block, three groups of plots totalling 1 hectare each were planted at 625, 1100 and 2500 stems/ha. Within each of these groups the individual plots representing treatments were randomly located. Plot size is 0.09 ha each surrounded by 10 m buffer strip and this results in a total area of 0.25 ha receiving the same treatment. One exception is the treatment designed to be reduced to 50 s/ha and for this the plots are 0.24 ha in order to include sufficient crop trees to provide an adequate sample.

The silvicultural schedules were designed by the late D. Revell and had the objective of testing 11 alternatives that would cover likely options for pulpwood, sawlog or mixed objective regimes. These have been modified since to give a wider range of final crop stocking levels as this will strengthen the use of the trial data for growth modelling purposes. Details of the regimes are shown on the attached treatment schedule where it can be seen that final crop stockings range from 2500/ha to 50/ha. Both pruned and unpruned regimes are included. In 1986 a twelfth regime testing 1 lift pruning to 6.0 m was added but no data are yet available for this option.

Measurements began in July 1982 and data are presented on the attached sheets. In 1982 all heights were measured for all trees in the trial and the statistic MCH (mean crop height) refers to the average in all cases. For subsequent measurements however the MCH statistic for treatments 1 to 4 inclusive, refers to the average height of a fixed sample of 30 trees selected at random across the diameter range but in proportion to the diameter frequency distribution. From 1983 onwards the data include a figure for increment and this is the arithmetic difference between the current and previous annual measurement. The trial was first thinned in 1983 immediately after the annual measurement and the sheet headed "1983 crop element" shows the data for the crop element after thinning. The increment is the difference in growth between the two years measurement; for the crop element alone. For each treatment the data are shown separately by blocks. Note that block C which is located more towards the ridge top invariably has the poorest growth. As can be seen from the attached schedule, pruning occurred in 1982, 1983 and 1986 for those regimes where it was prescribed.

February 1987

Eucalyptus Regnans Regimes Trial

Details of Treatment Schedules

St/ha over pruned height

Treatment	Initial stocking	4	5	6	7	8	9	10	11	12 Age	13	14	15	16	17	18	19	20 +
1	2500																	2500
2	2500		$\frac{1500}{0}$					$\frac{700}{0}$						$\frac{300}{0}$				$\frac{0}{0}$
3	2500		$\frac{1200}{0}$					$\frac{400}{0}$										$\frac{300}{0}$
4	1111																	$\frac{100}{0}$
5	2500	$\frac{2500}{2.4}$	$\frac{800}{4.5}$			$\frac{400}{6.0}$												$\frac{1111}{0}$
6	1111	$\frac{1111}{2.4}$	$\frac{650}{4.5}$			$\frac{325}{6.0}$												$\frac{400}{6.0}$
7	1111	$\frac{1111}{2.4}$	$\frac{500}{4.5}$			$\frac{250}{6.0}$												$\frac{325}{6.0}$
8	1111	$\frac{1111}{4.5}$	$\frac{400}{6.0}$			$\frac{100}{6.0}$												$\frac{250}{6.0}$
9	625	$\frac{625}{4.5}$	$\frac{275}{6.0}$			$\frac{200}{6.0}$												$\frac{100}{6.0}$
10	625	$\frac{625}{4.5}$	$\frac{125}{6.0}$															$\frac{200}{6.0}$
11	625	$\frac{625}{4.5}$	$\frac{200}{6.0}$			$\frac{100}{6.0}$	$\frac{50}{6.0}$											$\frac{125}{6.0}$
12	1737					$\frac{400}{6.0}$		$\frac{100}{6.0}$										$\frac{50}{6.0}$
																		$\frac{100}{6.0}$

R1980 E.REGNANS, MURUPARA, REGIMES TRIAL

DATA COLLECTED JULY 1982

TREATMENT	STOCKING	BASAL AREA (m/ha)	DBH(cm) (mean tree)	MCH (m)
1A	2478	10.44	7.32	7.13
1B	2233	10.48	7.73	7.05
1C	2333	4.48	4.94	4.69
MEAN	2348	8.47	6.77	6.29
2A	2500	10.60	7.35	7.11
2B	2456	9.67	7.08	6.81
2C	2278	3.86	4.65	4.69
MEAN	2411	8.04	6.52	6.24
3A	2267	8.84	7.05	6.90
3B	2222	10.98	7.93	7.23
3C	2300	6.63	6.06	5.55
MEAN	2263	8.82	7.04	6.55
4A	1056	6.65	8.96	7.59
4B	1122	6.69	8.71	7.10
4C	1044	5.58	8.25	7.15
MEAN	1074	6.31	8.65	7.28
5A	2489	10.97	7.49	7.26
5B	2322	9.18	7.09	6.70
5C	2311	7.47	6.42	6.13
MEAN	2374	9.21	7.03	6.71
6A	1033	5.52	8.25	7.09
6B	1078	7.37	9.33	7.88
6C	1067	5.33	7.98	6.70
MEAN	1059	6.07	8.55	7.22
7A	1078	7.50	9.41	7.89
7B	1067	6.06	8.51	7.50
7C	1033	5.19	7.99	6.77
MEAN	1059	6.25	8.67	7.40
8A	1200	8.21	9.33	7.83
8B	922	7.35	10.08	8.70
8C	1011	4.94	7.88	6.73
MEAN	1044	6.83	9.13	7.75
9A	567	4.48	10.03	7.25
9B	622	5.14	10.26	8.02
9C	667	1.52	5.39	4.70
MEAN	619	3.71	8.74	6.59
10A	633	6.16	11.13	8.41
10B	611	5.30	10.50	8.08
10C	611	1.59	5.76	5.07
MEAN	618	4.35	9.46	7.20
11A	633	5.06	10.09	7.99
11B	600	4.53	9.80	7.69
11C	588	2.41	7.22	5.84
MEAN	607	4.00	9.16	7.20

R1980 E.REGNANS, MURUPARA, REGIMES TRIAL

DATA COLLECTED JUNE 1983

TREATMENT	STOCKING	BASAL AREA (m/ha)	DBH(cm) (mean tree)	MCH (m)
1A	2467	14.58	8.67	9.29
1B	2200	14.40	9.13	9.95
1C	2344	7.16	6.24	8.92
MEAN	2337	12.05	8.10	9.39
ANN. INCREMENT	-11	3.58	1.32	3.10
2A	2444	14.29	8.63	10.07
2B	2367	13.44	8.50	9.82
2C	2211	6.09	5.92	8.51
MEAN	2341	11.27	7.83	9.53
ANN. INCREMENT	-30	3.23	1.36	3.15
3A	2222	13.01	8.64	9.73
3B	2178	15.32	9.46	10.62
3C	2244	9.12	7.19	9.13
MEAN	2215	12.49	8.47	10.15
ANN. INCREMENT	-48	3.67	1.42	3.59
4A	1056	10.02	11.00	9.08
4B	1122	10.01	10.66	9.00
4C	1056	8.11	9.89	8.80
MEAN	1078	9.38	10.53	8.96
ANN. INCREMENT	-4	3.07	1.88	1.68
5A	2444	15.34	8.94	10.49
5B	2322	12.25	8.20	9.81
5C	2267	10.58	7.71	9.92
MEAN	2344	12.72	8.31	10.07
ANN. INCREMENT	-30	3.51	1.30	3.37
6A	1011	8.34	10.25	9.24
6B	1056	10.71	11.36	11.21
6C	1033	7.56	9.65	9.46
MEAN	1033	8.87	10.45	9.96
ANN. INCREMENT	-16	2.80	1.91	2.74
7A	1044	10.68	11.41	10.71
7B	1022	8.59	10.34	10.76
7C	1033	7.58	9.66	10.26
MEAN	1033	8.95	10.50	10.57
ANN. INCREMENT	-26	2.70	1.84	3.18
8A	1178	11.24	11.02	10.47
8B	878	10.10	12.10	11.99
8C	878	5.90	9.25	9.80
MEAN	978	9.08	10.87	10.75
ANN. INCREMENT	-66	2.25	1.73	3.00
9A	533	5.90	11.87	10.33
9B	600	7.40	12.53	10.94
9C	622	2.62	7.33	7.85
MEAN	585	5.31	10.75	9.71
ANN. INCREMENT	-34	1.60	1.90	3.05
10A	489	6.92	13.42	11.47
10B	611	8.20	13.07	11.51
10C	567	2.66	7.72	9.05
MEAN	556	5.92	11.65	10.68
ANN. INCREMENT	-62	1.57	2.21	3.49
11A	596	7.42	12.59	10.94
11B	558	7.22	12.83	11.53
11C	554	3.75	9.28	9.74
MEAN	569	6.13	11.71	10.75
ANN. INCREMENT	-38	2.13	2.58	3.55

R1980 E.REGNANS, MURUPARA, REGIMES TRIAL

DATA COLLECTED JUNE 1983 [CROP ELEMENT]

TREATMENT	STOCKING	BASAL AREA (m/ha)	DBH(cm) (mean tree)	MCH (m)
2A	1556	11.56	9.73	10.07
2B	1556	11.33	9.63	9.82
2C	1500	5.96	6.95	8.51
MEAN	1537	9.53	8.86	9.47
ANN. INCREMENT	1537	2.96	1.47	2.43
3A	1211	9.97	10.24	9.73
3B	1200	10.48	10.54	10.64
3C	1200	7.13	8.70	9.13
MEAN	1204	9.19	9.86	9.83
ANN. INCREMENT	1204	2.79	1.63	2.28
5A	800	7.88	11.20	10.49
5B	811	6.54	10.13	9.81
5C	800	6.64	10.28	9.92
MEAN	804	7.02	10.55	10.07
ANN. INCREMENT	804	1.92	1.56	1.94
6A	644	6.47	11.30	9.24
6B	633	8.32	12.93	11.21
6C	644	6.14	11.01	9.46
MEAN	640	6.98	11.78	9.97
ANN. INCREMENT	640	2.22	2.06	1.84
7A	500	6.81	13.17	10.71
7B	500	5.76	12.14	10.76
7C	500	5.28	11.59	10.26
MEAN	500	5.96	12.32	10.57
ANN. INCREMENT	500	1.84	2.08	2.08
8A	400	5.59	13.34	10.47
8B	400	5.57	13.31	11.99
8C	400	3.74	10.89	9.80
MEAN	400	4.96	12.57	10.75
ANN. INCREMENT	400	1.32	1.80	1.71
9A	278	4.54	14.43	10.52
9B	278	4.39	14.19	10.94
9C	278	1.83	9.15	7.85
MEAN	278	3.59	12.82	9.77
ANN. INCREMENT	278	1.10	2.14	1.82
10A	122	2.25	15.31	11.47
10B	122	2.36	15.67	11.51
10C	122	1.07	10.54	9.05
MEAN	122	1.89	14.04	10.68
ANN. INCREMENT	122	0.56	2.29	1.98
11A	204	3.02	13.72	10.94
11B	200	3.97	15.91	11.53
11C	200	2.24	11.93	9.74
MEAN	201	3.08	13.94	10.74
ANN. INCREMENT	201	1.06	2.63	2.08

R1980 E.REGNANS,MURUPARA,REGIMES TRIAL

DATA COLLECTED JULY 1984

TREATMENT	STOCKING	BASAL AREA (m/ha)	DBH(cm) (mean tree)	MCH (m)
1A	2456	18.52	9.80	10.92
1B	2178	17.22	10.03	11.35
1C	2322	10.72	7.67	10.78
MEAN	2318	15.48	9.22	11.02
ANN. INCREMENT	-19	3.43	1.12	1.55
2A	1556	14.39	10.85	11.51
2B	1533	13.95	10.76	11.26
2C	1489	8.49	8.52	10.34
MEAN	1526	12.28	10.12	11.02
ANN. INCREMENT	-11	2.75	1.26	1.19
3A	1211	13.14	11.75	11.40
3B	1200	13.14	11.81	11.71
3C	1200	9.79	10.19	10.40
MEAN	1204	12.02	11.28	11.16
ANN. INCREMENT	0	2.83	1.42	1.09
4A	1056	13.35	12.69	10.88
4B	1100	13.04	12.28	10.59
4C	1067	10.56	11.23	10.44
MEAN	1074	12.32	12.08	10.64
ANN. INCREMENT	-4	2.94	1.55	1.68
5A	789	9.68	12.48	11.29
5B	811	8.12	11.29	10.55
5C	800	8.54	11.66	11.20
MEAN	800	8.78	11.81	11.01
ANN. INCREMENT	-3	1.76	1.26	0.94
6A	644	8.30	12.81	10.60
6B	633	10.62	14.61	12.40
6C	644	7.79	12.41	10.56
MEAN	640	8.90	13.30	11.18
ANN. INCREMENT	0	1.92	1.52	1.21
7A	500	8.56	14.79	11.65
7B	500	7.55	13.86	12.15
7C	478	6.72	13.38	11.37
MEAN	493	7.62	14.03	11.73
ANN. INCREMENT	-7	1.66	1.71	1.16
8A	400	6.94	14.87	11.56
8B	400	7.31	15.26	13.80
8C	400	4.87	12.45	10.97
MEAN	400	6.37	14.24	12.11
ANN. INCREMENT	0	1.41	1.67	1.36
9A	278	5.64	16.08	11.78
9B	278	5.88	16.42	12.90
9C	278	2.95	11.63	9.17
MEAN	278	4.82	14.87	11.29
ANN. INCREMENT	0	1.32	2.05	1.52
10A	122	2.89	17.35	12.57
10B	122	3.16	18.14	12.95
10C	122	1.66	13.14	10.13
MEAN	122	2.57	16.36	11.86
ANN. INCREMENT	0	0.68	2.32	1.18
11A	204	4.13	16.05	11.99
11B	200	5.40	18.54	13.41
11C	200	3.26	14.41	11.32
MEAN	201	4.27	16.42	12.24
ANN. INCREMENT	0	1.19	2.48	1.50

R1980 E.REGNANS, MURUPARA, REGIMES TRIAL

DATA COLLECTED AUGUST 1985

TREATMENT	STOCKING	BASAL AREA (m/ha)	DBH(cm) (mean tree)	MCH (m)
1A	2400	22.01	10.81	12.03
1B	2044	20.19	11.21	12.64
1C	2300	13.99	8.80	12.62
MEAN	2248	18.73	10.30	12.43
ANN. INCREMENT	-70	3.25	1.08	1.41
2A	1556	16.65	11.67	12.68
2B	1500	16.04	11.67	12.58
2C	1478	11.94	10.14	12.13
MEAN	1511	14.88	11.20	12.46
ANN. INCREMENT	-15	2.60	1.08	1.44
3A	1211	16.34	13.11	12.73
3B	1178	15.62	13.00	13.12
3C	1200	12.69	11.60	12.20
MEAN	1196	14.88	12.59	12.68
ANN. INCREMENT	-8	2.86	1.31	1.52
4A	1022	16.11	14.17	12.02
4B	1044	15.79	13.87	12.33
4C	1022	12.91	12.68	11.90
MEAN	1030	14.94	13.59	12.09
ANN. INCREMENT	-44	2.62	1.51	1.45
5A	756	11.26	13.78	12.20
5B	811	10.82	13.03	12.10
5C	800	11.20	13.35	12.75
MEAN	789	11.09	13.38	12.35
ANN. INCREMENT	-11	2.31	1.56	1.34
6A	644	10.73	14.56	11.83
6B	633	12.95	16.13	14.51
6C	644	9.93	14.01	12.37
MEAN	640	11.20	14.92	12.89
ANN. INCREMENT	0	2.30	1.62	1.71
7A	489	10.30	16.38	12.78
7B	500	9.24	15.34	14.24
7C	478	8.85	15.36	13.42
MEAN	489	9.47	15.70	13.48
ANN. INCREMENT	-4	1.85	1.67	1.75
8A	400	8.77	16.71	12.64
8B	400	9.40	17.30	16.02
8C	389	6.40	14.47	12.93
MEAN	396	8.19	16.22	13.87
ANN. INCREMENT	-4	1.82	1.98	1.76
9A	278	7.49	18.53	13.71
9B	278	7.75	18.85	14.80
9C	278	4.60	14.53	11.43
MEAN	278	6.62	17.41	13.31
ANN. INCREMENT	0	1.80	2.54	2.02
10A	111	3.82	20.92	14.45
10B	122	4.29	21.13	14.59
10C	122	2.48	16.07	12.54
MEAN	118	3.53	19.47	13.84
ANN. INCREMENT	-4	0.96	3.11	1.98
11A	204	5.69	18.84	13.95
11B	200	7.02	21.14	15.04
11C	200	4.69	17.29	13.44
MEAN	201	5.80	19.15	14.14
ANN. INCREMENT	0	1.53	2.73	1.90

R1980 E.REGNANS, MURUPARA, REGIMES

DATA COLLECTED JUNE 1986

TREATMENT	STOCKING	BASAL AREA (m/ha)	DBH(cm) (mean tree)	MCH (m)
1A	2300	25.07	11.78	13.36
1B	1867	23.19	12.58	14.36
1C	2222	16.84	9.82	14.08
MEAN	2130	21.70	11.39	13.93
ANN. INCREMENT	-118	2.79	1.09	1.50
2A	1556	18.58	12.33	13.81
2B	1444	17.55	12.44	13.94
2C	1478	14.84	11.31	13.33
MEAN	1493	16.99	12.04	13.67
ANN. INCREMENT	-18	2.11	0.84	1.21
3A	1211	19.27	14.23	14.01
3B	1178	17.65	13.81	14.24
3C	1200	15.66	12.89	12.97
MEAN	1196	17.52	13.66	13.73
ANN. INCREMENT	0	2.64	1.07	1.05
4A	989	18.77	15.54	13.53
4B	1011	18.82	15.40	13.39
4C	989	15.21	13.99	13.16
MEAN	996	17.60	15.00	13.36
ANN. INCREMENT	-34	2.66	1.41	1.27
5A	744	12.93	14.87	13.72
5B	811	13.02	14.30	13.70
5C	800	13.35	14.58	14.13
MEAN	785	13.10	14.58	13.85
ANN. INCREMENT	-4	2.01	1.20	1.50
6A	644	13.30	16.21	13.44
6B	622	14.99	17.51	16.37
6C	633	11.89	15.46	13.95
MEAN	633	13.39	16.41	14.57
ANN. INCREMENT	-7	2.19	1.49	1.68
7A	489	12.02	17.69	13.96
7B	500	10.95	16.70	16.07
7C	478	10.38	16.63	14.82
MEAN	489	11.12	17.02	14.96
ANN. INCREMENT	0	1.65	1.32	1.48
8A	400	10.53	18.31	14.27
8B	400	11.27	18.94	17.74
8C	389	7.80	15.98	14.54
MEAN	396	9.87	17.81	15.53
ANN. INCREMENT	0	1.68	1.59	1.66
9A	278	9.29	20.63	15.62
9B	278	9.33	20.68	16.59
9C	278	6.09	16.71	12.72
MEAN	278	8.24	19.43	14.98
ANN. INCREMENT	0	1.62	2.02	1.67
10A	111	4.72	23.25	16.22
10B	111	4.65	23.09	16.02
10C	122	3.11	18.00	13.70
MEAN	115	4.16	21.48	15.26
ANN. INCREMENT	-3	0.63	2.01	1.42
11A	204	7.13	21.08	15.96
11B	200	8.76	23.62	16.93
11C	200	5.90	19.38	15.05
MEAN	201	7.26	21.43	15.98
ANN. INCREMENT	0	1.46	2.28	1.84

HEIGHT DIAMETER RELATIONSHIP FOR REGNANS SPACING TRIAL

