

9. Coppicing ability

Teak coppicing was studied in Clone Bank, Uthai Thani after all ramets was cut. Coppicing ability and sprouts growth of 71 clones was recorded and evaluated at the ages of 1, 2, 3, 4, 5, 6, 12 and 18 months.

Based on the available information, teak is one of the good coppiced tree species. Teak coppices vigorously and sometimes retain the power of coppicing in a considerable size. Moreover the early growth of coppice shoots is rapid and this would shorten the second rotation age.

The potential of coppice shoot originated from plus trees in clone bank was studied (Table 25). The results showed that number of sprouts in all clones ranged from 3 sprout stool⁻¹ (clone V72) to 41 sprout stool⁻¹ (clone V100) with the overall average value of 18.86. The top five clones showed high potential in coppice were clones **V100, V34, V126, V49** and **V118**. Beside, most clones expressed the excellence in coppicing and coppicing percentage, only clone V129 had no sprouts in the first record. Moreover, growth of height of all sprouts was measured and found that the overall average was 0.85 m.

Additionally, correlation between stump size (D_{10}) and sprout ability (number) showed the low value in relation ($r=0.358$). That means number of sprout does not depend on stump size.

10. Sprouts Growth

10.1 Height Growth

In the present study height growth of all sprouts was measured successively during May 2002 to October 2004 as shown in Table 26 and Figure 20. At the age of 1 month after coppicing, the total average of height growth of sprouts was 2.25 m, ranging from 1.50 m (clones V78 and V84) to 2.85 m (clone V45). At the 6 months old, the total average height had increased to 5.22 m and ranged from 1.81 m (clone V84) to 6.98 m (clone V100). After coppicing 12 months, the overall average height had reached to 5.33 m, varying from 2.94 m (clone V78) to 7.27 m (clone V100). Finally at 18 months old, the average height ranged from 3.72 m (clone V78) to 8.40 m (clone V45) with mean of 6.33 m. and clones **V45, V100, V118, V46, V27, V34, V42, V41, V49, V80** had the excellent height growth. More than half of sprouts showed the good height performance during early growth period. Moreover, in view of height increment, it had increased greatly in the first record and slightly afterward.

10.2 D_0 growth

In the present study, growth in D_0 of teak sprouts after coppicing was measured at 1, 2, 3, 4, 6, 12 and 18 months old as shown in Table 27 and Figure 21. At the first months, the total average D_0 of sprout was 3.55 cm, varying between 2.50 cm (clone V95) to 5.07 cm (clone V118). At 6 months old, the overall average D_{10} was 6.37 cm, ranged from 3.18 cm (clone V84) to 8.35 cm (clone V118). At the age of 12 months, overall average D_{10} was 6.40 cm, varying from 3.51 cm (clone V39) to

Table 25 Number and height of sprout in each clone at the age of 1 month after harvesting in clone bank, Uthai Thani

Clones	Number of sprout	%	Average height (m)	Clone No.	Number of sprout	%	Average height (m)
V3	7	100	1.30	V83	10	50	1.60
V4	19	100	0.57	V84	12	50	1.61
V7	7	75	1.22	V85	8	75	0.89
V22	19	75	0.56	V86	8	75	0.70
V23	20	75	0.69	V88	9	50	1.12
V24	28	100	0.68	V89	11	75	0.88
V25	24	100	0.51	V90	18	100	0.89
V26	19	100	0.46	V92	26	100	0.61
V27	14	75	0.85	V93	30	100	0.74
V28	27	100	0.63	V95	7	25	1.74
V29	7	50	1.13	V96	34	100	0.74
V30	14	75	0.71	V97			
V32	17	100	0.76	V98	11	75	0.85
V33	9	50	1.11	V99	11	100	0.58
V34	37	100	0.87	V100	41	100	0.57
V35	25	100	0.78	V110	16	100	0.93
V36	24	100	0.64	V111	15	50	1.03
V37	25	100	0.87	V112	22	100	0.66
V38	28	75	0.65	V113	25	100	0.66
V39	13	50	1.04	V114	19	100	0.60
V40	22	100	0.64	V115	23	75	0.81
V41	20	100	0.88	V116	17	100	0.70
V42	19	75	0.98	V117	20	75	0.80
V43	24	100	0.64	V118	31	100	0.69
V45	25	100	0.77	V119	7	50	0.82
V46	5	25	2.53	V120	20	75	1.11
V49	32	100	0.70	V121	19	100	0.51
V69	16	75	0.86	V122	13	100	0.66
V72	3	25	2.23	V123	21	100	0.64
V73	20	100	0.47	V124	27	100	0.61
V74	15	75	0.64	V126	34	100	0.44
V76	22	75	0.55	V127	27	75	0.81
V78	4	25	1.14	V128	24	100	0.54
V79				V129			
V80	14	75	0.96	V130	19	100	0.59
V81	24	100	0.93	<i>Average</i>	<i>18.86</i>	<i>82.72</i>	<i>0.85</i>

Table 26 Average height of 71 clones at the ages of 1,2,3,4,5,6,12,18 months after coppicing at teak clone bank, Uthai Thani

Clones	Average height (m) in various ages (months)							
	1	2	3	4	5	6	12	18
V3	2.70	3.89	4.53	4.82	5.55	5.64	5.88*	6.83
V4	2.03	3.07	3.59	3.85	4.70	4.92	5.02	6.62
V7	1.83	2.57	3.23	3.40	3.86	4.28	4.36	5.04
V2	2.70	3.70	4.24	4.60	5.10	5.67	5.87	6.88
V23	1.99	3.60	4.44	4.53	5.21	5.52	5.97	6.78
V24	2.55	4.22	4.46	4.78	5.24	5.61	5.63*	7.35
V25	2.10	3.19	3.59	3.80	4.24	4.52	4.64	6.13
V26	2.12	3.33	3.71	3.93	4.26	4.65	4.64*	5.98
V27	2.37	3.69	4.31	4.73	5.45	5.97	6.13	7.75
V28	2.18	3.31	3.51	3.55*	4.24	4.60	4.76	6.11
V29	2.68	2.44**	2.98	3.40	3.97	4.49	4.44*	5.42
V30	1.87	3.31	3.70	4.13	4.62	5.11	4.95*	5.95
V32	2.72	3.86	4.36	4.85	5.50	5.93	5.96*	6.54
V33	2.02	3.76	4.18	4.63	5.13	4.98*	5.20	6.86
V34	2.40	4.51	4.93	5.49	6.05	6.28	6.53	7.73
V35	2.66	3.68	3.80	4.66	4.17*	4.51	3.81*	6.65
V36	2.38	3.60	3.99	4.74	5.16	5.52	5.59*	5.86
V37	2.51	3.67	3.82	4.45	4.89	5.24	5.62	6.86
V38	2.00	3.16	3.52	3.95	4.31	4.48	4.01*	4.70
V39	2.17	3.76	4.21	4.92	5.50	6.07	3.05*	4.11
V40	2.32	3.07	3.62	4.18	4.30	4.52	3.83*	5.63
V41	2.48	3.70	4.23	5.01	5.02*	5.76	5.82	7.53
V42	2.68	4.32	4.41	4.78	5.01	5.55	6.06	7.57
V43	2.60	3.63	4.28	4.75	5.06	5.74	6.08	6.84
V45	2.85	4.01	4.76	5.20	5.61	5.84	7.02	8.40
V46	2.00	3.59	3.85	4.50	4.70	5.64	6.28	7.80
V49	2.49	3.46	3.69	4.35	4.92	5.10	5.59	7.39
V69	2.30	3.32	3.74	4.41	4.74	5.20	5.35	6.69
V72	2.50	3.30	3.40	3.55	3.96	4.20	3.06*	4.72
V73	2.18	3.20	3.61	4.06	4.23	4.66	4.81	6.49
V74	1.90	3.19	3.85	4.51	4.84	5.39	5.41*	6.65
V76	2.30	3.10	4.12	4.87	5.19	5.96	5.72*	6.45
V78	1.50	2.95	3.50	4.55	4.66	5.10	2.94*	3.72
V79	-	-	-	-	-	-	-	-
V80	2.17	3.06	3.43	4.16	4.65	4.88	5.27	7.35
V81	2.74	4.34	4.88	5.56	5.77	6.24	6.69	6.91
V83	2.32	3.97	4.46	5.23	5.43	6.06	6.40	7.20
V84	1.50	2.83	3.30	3.97	1.85*	1.81	3.00	4.80
V85	2.25	3.18	3.42	3.79	3.68	4.30	4.13*	5.10
V86	1.73	2.75	3.43	3.90	4.11	4.55	4.71	6.33
V88	2.20	2.95	3.28	3.91	4.02	4.58	4.72	6.05

Table 26 (continued)

Clones	Average height (m) in various ages (months)							
	1	2	3	4	5	6	12	18
V92	2.50	3.51	3.56	4.43	4.44	5.01	5.19	5.70
V93	2.45	4.04	4.48	5.18	5.41	6.15	7.00	4.70*
V95	2.10	3.64	4.35	5.00	5.45	6.21	3.91*	4.33
V96	2.38	3.53	4.24	4.96	5.09	5.91	6.13	6.56
V97	-	-	-	-	-	-	-	-
V98	2.41	3.64	3.88	4.44	4.45*	5.13	5.27	6.77
V99	1.90	3.08	3.91	4.38	3.81*	4.20	5.02	6.60
V100	2.64	4.26	5.01	5.84	6.44	6.98	7.27	8.40
V110	2.77	3.69	4.09	4.69	4.98	5.56	5.63	7.08
V111	2.56	3.83	3.75*	4.81	3.04*	3.57	5.61	6.03
V112	1.99	2.95	3.45	3.98	3.30*	3.93	4.38	4.95
V113	2.43	3.77	4.03	4.42	4.91	5.39	5.70	5.64*
V114	2.36	3.55	4.04	4.23	5.05	5.68	6.08	5.83*
V115	2.32	3.82	3.76*	4.25	4.54	5.17	5.10*	6.38
V116	2.11	3.24	3.95	4.82	4.29*	5.09	5.32	6.63
V117	2.22	3.47	3.92	4.47	4.79	5.26	5.53	6.89
V118	2.72	4.12	4.34	4.20*	4.68	5.33	5.79	8.00
V119	1.68	3.09	3.62	4.46	4.84	5.14	4.68*	5.65
V120	2.80	4.51	5.19	5.74	6.14	6.67	6.93	7.20
V121	2.16	3.42	4.02	4.84	5.41	6.12	6.25	6.90
V122	1.95	3.03	3.60	4.20	4.66	5.14	5.22	6.11
V123	1.62	2.99	4.38	4.32*	4.84	5.39	5.39*	5.84
V124	2.15	3.64	4.13	4.84	5.21	5.57	5.60*	5.97
V126	1.95	3.76	4.50	5.14	4.46*	6.25	6.48	7.33
V127	2.30	3.55	4.27	4.73	5.38	4.64*	5.03	5.14
V128	2.33	3.34	4.03	4.75	5.09	5.38	5.45	6.82
V129		3.91	4.90	5.64	6.15	6.30	6.86	6.07*
V130	1.58	3.28	3.24*	3.73	3.95	4.10	6.67	7.03
Total average	2.25	3.49	3.97	4.51	4.76	5.22	5.33	6.33

* Stem was broken by storm.

Table 27 Average D_0 of 71 clones at the ages of 1,2,3,4,5,6,12,18 months after coppicing at teak clone bank, Uthai Thani

Clones	Average D_{10} (cm)) in various ages (months)							
	1	2	3	4	5	6	12	18
V3	3.87	4.99	5.46	6.18	6.59	7.24	7.56	9.50
V4	3.28	4.39	4.51	5.48	6.06	6.44	6.41	7.05
V7	3.25	3.64	4.32	5.35	5.72	5.66	5.83	7.00
V22	4.31	5.32	5.70	6.53	6.92	7.18	7.43	12.00
V23	3.01	4.32	4.60	5.43	5.83	6.03	6.33	10.12
V24	3.53	4.68	5.04	5.93	6.31	6.51	6.88	10.60
V25	3.46	4.35	4.55	5.41	5.84	5.83	6.08	7.15
V26	3.55	4.59	4.99	5.99	6.24	6.74	6.85	9.71
V27	3.73	4.87	5.28	5.88	6.45	6.83	6.93	10.44
V28	3.19	3.98	4.25	4.88	5.19	5.61	6.00	7.60
V29	4.27	3.65	3.94	4.73	4.93	5.07	5.28	10.16
V30	3.11	4.37	4.70	5.65	6.03	6.36	6.57	8.05
V32	3.97	4.91	5.16	6.03	6.35	6.64	6.71	9.71
V33	3.58	4.80	5.10	6.13	6.38	6.34	6.65	9.40
V34	4.29	5.63	5.76	6.93	6.99	7.15	7.09	11.35
V35	3.53	4.51	4.79	5.65	5.91	5.84	5.29	9.15
V36	3.61	4.59	5.05	6.20	6.43	6.49	6.71	3.60
V37	3.46	4.34	4.50	5.46	5.80	6.08	6.15	9.60
V38	3.28	4.08	4.72	5.57	5.68	5.95	5.50	10.05
V39	3.59	4.50	4.93	5.43	5.95	6.10	3.51	9.50
V40	3.61	4.60	5.01	5.66	5.72	6.02	4.65	6.85
V41	3.81	4.91	5.78	6.65	7.33	7.44	7.73	11.30
V42	3.15	4.67	5.15	5.97	6.35	6.48	6.75	10.51
V43	3.59	4.31	4.76	5.60	6.08	6.78	6.28	8.75
V45	3.78	4.43	4.80	5.55	6.04	6.09	7.12	9.23
V46	3.48	4.60	5.10	5.70	6.30	6.50	6.75	9.70
V49	3.55	4.56	5.38	5.93	6.45	7.23	7.36	11.62
V69	3.40	4.33	5.15	5.82	6.40	6.88	7.05	10.89
V72	3.50	4.15	4.50	5.10	5.15	5.50	4.35	6.08
V73	4.44	4.34	4.65	5.51	5.60	5.89	5.94	7.70
V74	3.73	4.87	5.52	5.72	6.40	6.74	6.62	7.55
V76	4.10	5.23	5.35	6.23	6.95	7.05	6.93	8.00
V78	3.12	4.70	5.65	6.45	7.45	7.20	4.20	4.75
V79								
V80	2.94	3.93	4.20	5.33	5.81	6.08	6.10	9.15
V81	4.50	5.45	6.05	6.83	7.11	7.37	7.51	12.48
V83	3.58	4.80	5.50	6.10	6.58	6.83	7.00	9.55
V84	3.30	4.98	5.50	6.25	4.15	3.18	3.90	6.85
V85	3.78	4.75	5.02	5.47	5.40	5.74	5.49	6.10
V86	2.97	3.63	3.67	4.45	4.78	5.44	5.65	8.00
V88	3.00	4.05	4.55	5.60	5.90	6.08	5.98	7.75

Table 27 (continued)

Clones	Average D ₀ (cm)) in various ages (months)							
	1	2	3	4	5	6	12	18
V89	3.34	4.38	4.75	5.38	6.00	6.03	6.13	8.85
V90	2.94	4.63	5.23	6.18	6.47	6.51	6.65	8.85
V92	3.49	4.38	4.74	5.59	5.94	6.21	6.55	8.45
V93	3.45	4.39	4.73	5.66	6.39	6.51	6.70	7.55
V95	2.50	3.60	4.45	5.95	6.00	6.93	4.58	4.90
V96	3.33	4.34	5.23	6.25	6.69	6.72	6.91	10.30
V97	-	-	-	-	-	-	-	-
V98	3.87	4.75	5.03	5.93	6.15	6.40	6.52	8.35
V99	3.01	3.79	4.38	5.23	5.33	5.85	5.84	9.90
V100	3.90	5.43	6.11	6.84	7.63	8.02	8.33	11.40
V110	3.78	4.18	4.69	5.66	6.20	6.90	7.01	10.85
V111	4.29	5.38	5.83	6.95	4.65	5.30	7.10	8.22
V112	3.24	4.03	4.51	5.28	4.63	5.13	5.34	6.18
V113	3.79	4.60	5.18	6.06	6.21	6.56	6.55	7.35
V114	3.56	4.29	4.86	5.90	6.44	6.63	6.79	7.08
V115	3.41	3.70	4.22	5.37	5.63	6.02	6.15	7.73
V116	3.36	4.18	4.90	5.99	5.38	6.01	6.20	8.23
V117	3.46	4.08	4.72	5.68	6.27	6.37	6.91	8.46
V118	5.07	5.96	6.54	7.36	7.68	8.05	7.58	10.39
V119	2.82	3.58	4.30	5.30	5.55	5.83	5.57	7.60
V120	4.22	4.98	5.67	6.82	7.08	7.52	7.72	11.18
V121	3.59	4.66	5.50	7.01	7.19	7.53	7.87	11.23
V122	3.48	4.66	5.39	6.25	6.66	6.88	7.33	9.46
V123	2.71	3.64	4.36	5.09	5.53	5.77	5.84	7.61
V124	3.70	5.19	5.74	5.96	6.13	6.41	6.41	8.55
V126	3.46	4.61	5.30	6.23	5.24	7.02	7.10	10.44
V127	3.36	4.09	4.85	5.30	5.70	4.76	5.23	5.73
V128	3.71	4.51	5.13	6.03	6.52	7.00	7.25	9.61
V129	-	4.98	5.70	6.32	6.58	6.80	6.78	10.11
V130	3.45	4.66	4.74	5.28	4.84	5.03	7.80	10.14
Total average	3.55	4.51	5.01	5.85	6.09	6.37	6.40	8.80

8.33 cm (clone V100). At 18 months old, average D_{10} was between 3.60 cm (clone V36) and 12.48 cm (clone V81) with the mean of 8.80 cm and the top ten sprouts coppiced from clones **V81, V22, V49, V100, V34, V41, V121, V120, V69** and **V 110** respectively.

10.3 DBH growth

DBH of teak sprouts at the ages of 1, 2, 3, 4, 5, 6, 12 and 18 months old was studied and shown in Table 28 and Figure 22. At the age of 1 month, the overall average DBH was 2.22 cm, varying from 1.44 cm (clone V78) to 2.96 cm (clone V118). At 12 months old, the total average DBH was 4.58 cm, ranged from 2.55 cm (clone V84) to 6.38 cm (clone V100). And finally at the 18 months old, the average DBH ranged from 2.30 cm (clone V36) to 10.25 cm (clone V81) with the total average of 6.67 cm.

Considering to the result of height, D_0 and DBH growth of all sprouts at the ages of 1, 2, 3, 4, 5, 6, 12 and 18 months after coppicing was shown in Tables 26, 27 and 28. In some period of measurement, some teak sprouts showed less value in height and DBH that cause by top cut when strong storm occurred. Jaijing (1994) commented that it was poor decision to select *Eucalyptus deglupta* for the shelterbelt in this site unless it was planted at narrow spacing. The trend of growth increment in height, D_{10} and DBH increased slightly after the first month of coppicing as shown in Figure 23. It is normally aspect for growth of sprout.

11. Comparison between Sprouts and Ramets in Height Growth Performances

According to the previous study, the average height growth of all grafts at the ages of 3, 6, 12 and 18 months were 1.41, 2.07, 3.33 and 4.99 m (Table 29). When comparing the mean of height growth at the ages of 3, 6, 12 and 18 months between sprouts and ramets which all originated from the same clone set, the result showed that highly significant difference in height growth between sprouts and ramets was found ($P < 0.01$). From investigation the height growth rate between sprout and ramet was smaller when teaks get older (Figure 24). It might be taken into consideration as a better alternative in teak productivity management in the future. As discussion in many references, it indicated that in coppicing system, tree always had the rapidly growth in the early period. Besides, in some species, coppicing system will enhance the short rotation and productivity of plantation. For practical application, number of coppice should be reduced into 1-2 sprouts per ramet. Vigorous in both height and diameter growth can be observed.

Table 28 Average DBH of 71 clones at the ages of 1,2,3,4,5,6,12,18 months after coppicing at teak clone bank, Uthai Thani

Clones	Average DBH (cm)) in various ages (months)							
	1	2	3	4	5	6	12	18
V3	2.37	3.31	3.56	4.29	4.81	5.31	5.10	6.88
V4	1.98	3.77	3.10	3.71	4.23	4.66	4.61	5.05
V7	2.32	2.46	3.10	3.43	3.90	4.11	4.08	4.65
V22	2.65	3.35	4.00	4.52	4.97	5.07	5.12	9.05
V23	1.89	2.77	3.23	3.60	4.07	4.33	4.40	7.00
V24	2.19	3.31	3.53	4.10	4.39	4.69	4.79	7.95
V25	2.01	2.63	3.06	3.50	3.78	3.89	3.96	4.90
V26	1.98	3.05	3.23	3.93	4.13	4.36	4.41	5.95
V27	2.39	3.33	3.62	4.20	4.62	4.91	4.90	8.05
V28	1.91	2.53	2.99	3.36	3.79	4.18	4.19	5.85
V29	2.80	2.82	3.15	3.21	3.43	3.75	3.56	7.35
V30	1.78	2.83	3.15	3.80	4.22	4.53	4.73	6.15
V32	2.39	3.16	3.61	4.13	4.53	4.88	4.88	6.60
V33	2.23	2.95	3.65	4.10	4.43	4.53	4.50	6.80
V34	2.59	3.64	4.04	4.88	4.96	5.08	5.24	8.90
V35	2.00	2.75	3.08	3.55	3.95	4.23	4.68	6.90
V36	2.19	2.93	3.50	3.99	4.36	4.65	4.84	2.30
V37	2.32	2.75	3.18	3.56	4.11	4.22	4.29	6.55
V38	2.06	2.53	2.87	3.62	3.60	3.87	3.39	6.75
V39	2.13	3.13	3.65	4.05	4.75	4.95	2.60	7.30
V40	2.33	2.85	3.33	3.70	3.83	4.14	3.25	5.45
V41	2.60	3.48	4.16	4.79	5.33	5.84	5.77	7.85
V42	2.23	3.28	3.48	3.83	4.25	4.53	4.63	7.90
V43	2.22	2.90	3.64	4.05	4.30	4.58	4.71	6.80
V45	2.27	2.93	3.40	3.79	4.16	4.25	5.10	6.40
V46	2.25	3.05	3.50	3.90	4.50	4.75	4.85	7.60
V49	2.17	2.85	3.48	4.13	4.75	5.13	5.23	8.50
V69	2.16	2.85	3.55	4.13	4.57	4.93	4.95	7.85
V72	2.44	2.75	3.20	3.55	3.75	4.03	2.88	4.70
V73	2.12	2.71	3.18	3.55	3.84	4.06	4.14	6.00
V74	2.92	3.02	3.68	4.00	4.67	4.80	4.98	6.40
V76	2.45	3.32	3.95	4.42	4.98	5.21	4.88	6.35
V78	1.44	2.75	3.40	4.05	6.80	4.93	3.73	3.30
V79								
V80	2.55	2.66	2.85	3.61	4.08	4.34	4.38	7.40
V81	2.92	3.88	4.38	4.94	5.20	5.31	5.43	10.25
V83	2.38	3.25	3.75	4.35	4.68	5.10	5.13	7.35
V84	1.81	2.80	3.35	3.80	3.40	2.10	2.55	4.80
V85	2.33	2.82	3.30	3.42	3.52	3.82	3.65	4.45
V86	1.83	2.15	2.43	2.97	3.32	3.78	3.67	5.95
V88	2.06	2.48	3.15	3.63	3.88	4.13	4.18	5.65

Table 28 (continued)

Clones	Average DBH (cm) in various ages (months)							
	1	2	3	4	5	6	12	18
V89	1.77	2.55	2.90	3.50	3.78	4.10	4.15	6.35
V90	2.03	3.11	3.46	4.07	4.45	4.83	4.89	7.05
V92	2.32	2.88	3.30	3.79	4.19	4.53	4.57	6.65
V93	2.05	2.89	3.36	3.90	4.28	4.78	4.97	6.25
V95	1.72	2.40	2.80	3.50	3.85	4.33	2.97	3.05
V96	2.28	3.10	3.44	4.03	4.53	4.83	4.86	8.70
V97	-	-	-	-	-	-	-	-
V98	2.31	3.08	3.80	4.13	4.55	4.82	4.94	6.40
V99	2.13	2.48	3.05	3.55	3.88	4.18	3.93	7.45
V100	2.83	3.94	4.64	5.31	5.79	6.06	6.34	9.50
V110	2.12	2.63	3.21	3.94	4.46	5.01	5.33	8.75
V111	2.72	4.03	4.45	5.08	6.85	7.08	5.60	7.22
V112	2.16	2.54	2.96	3.45	3.85	4.23	3.65	4.48
V113	2.10	3.03	3.45	3.89	4.25	4.63	4.93	6.05
V114	2.17	2.90	3.38	3.98	4.34	4.70	4.98	7.53
V115	1.97	2.48	2.97	3.42	3.62	4.06	4.08	5.95
V116	1.89	2.63	3.43	3.93	4.72	4.12	4.35	6.30
V117	2.21	2.57	3.18	3.62	4.13	4.39	5.46	7.08
V118	2.96	4.08	4.54	5.13	5.45	6.01	6.14	8.44
V119	1.67	2.53	2.95	3.68	4.08	4.30	4.04	6.10
V120	2.61	3.43	4.03	4.70	5.15	5.34	5.49	6.88
V121	1.99	3.06	3.99	4.43	5.15	5.45	5.55	8.00
V122	2.29	2.96	3.54	3.81	4.48	4.83	5.02	6.99
V123	1.70	2.50	2.93	3.70	3.79	4.01	4.11	5.48
V124	2.79	3.55	4.03	4.36	4.48	4.63	4.61	6.47
V126	1.89	3.20	3.78	4.43	4.90	5.15	5.18	8.15
V127	2.10	3.04	3.36	3.93	4.11	3.46	3.72	4.68
V128	2.48	2.91	3.33	4.10	4.67	4.83	5.08	7.62
V129	-	3.90	4.43	5.05	5.42	5.31	5.50	7.62
V130	1.94	3.10	3.53	3.36	3.82	3.35	5.25	6.90
average	2.22	2.99	3.46	3.97	4.40	4.58	4.60	6.67

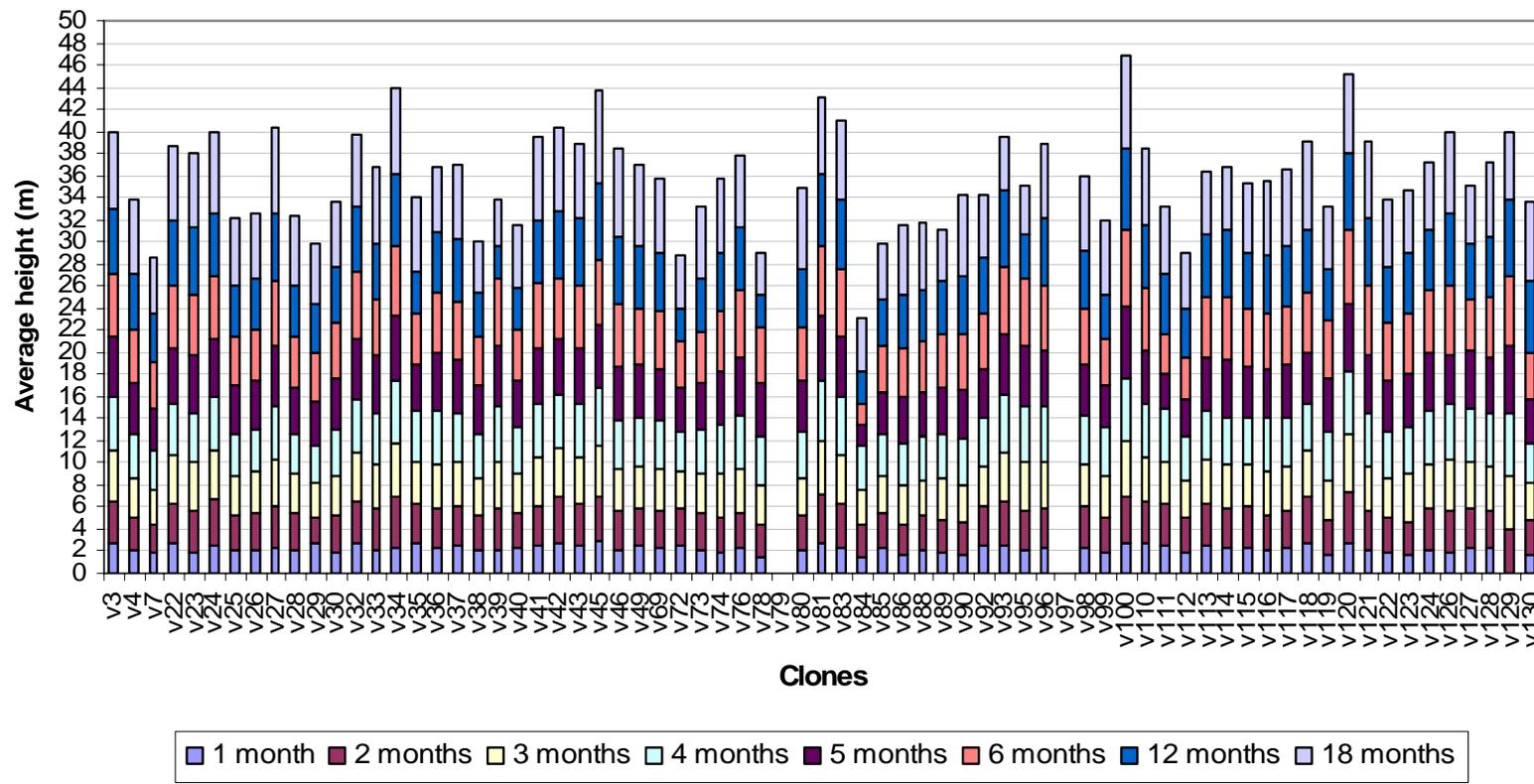


Figure 20 Average height of sprouts at the ages of 1, 2, 3, 4, 5, 6, 12 and 18 months, coppicing from 71 clones at Clone Bank, Uthai Thani.

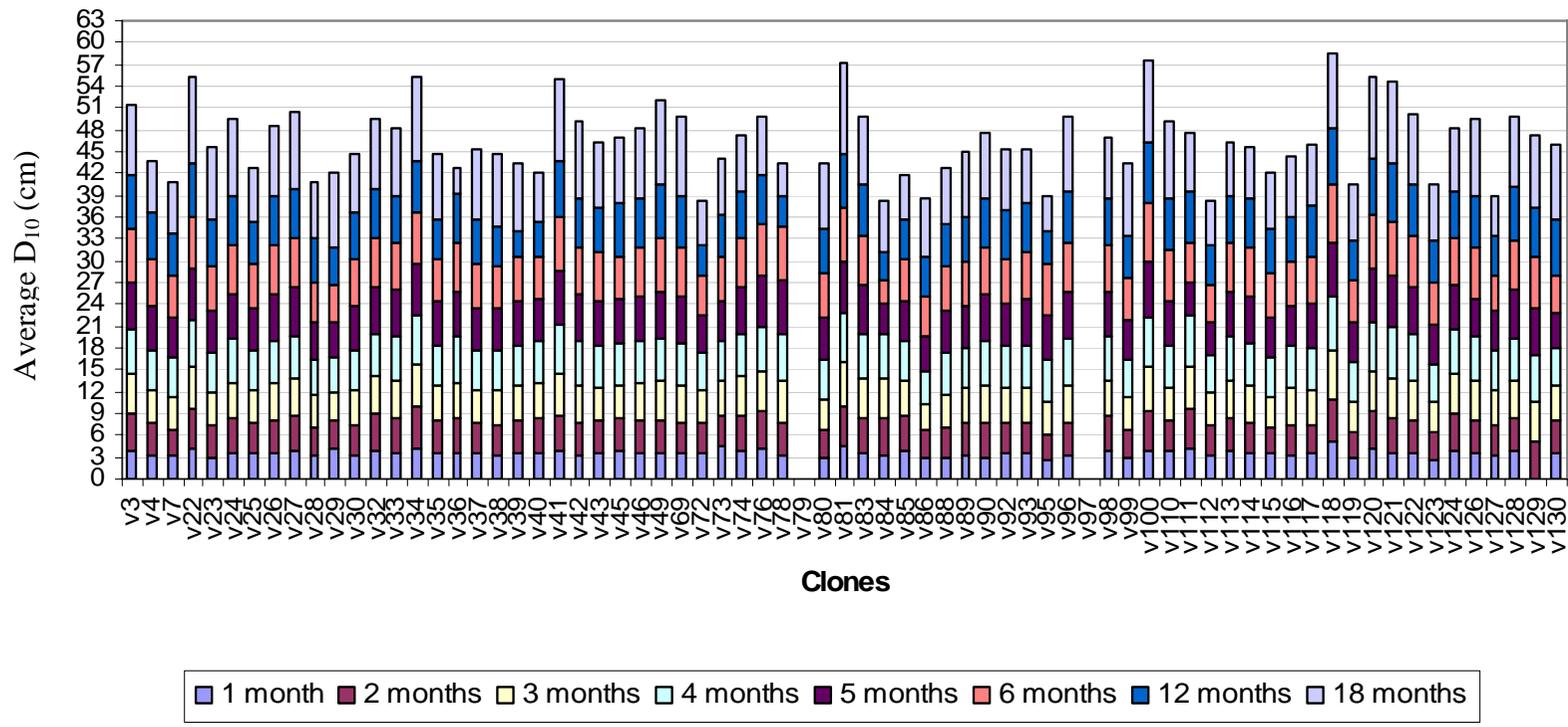


Figure 21 Average D₀ of sprouts at the ages of 1, 2, 3, 4, 5, 6, 12 and 18 months, coppicing from 71 clones at Clone Bank, Uthai Thani.

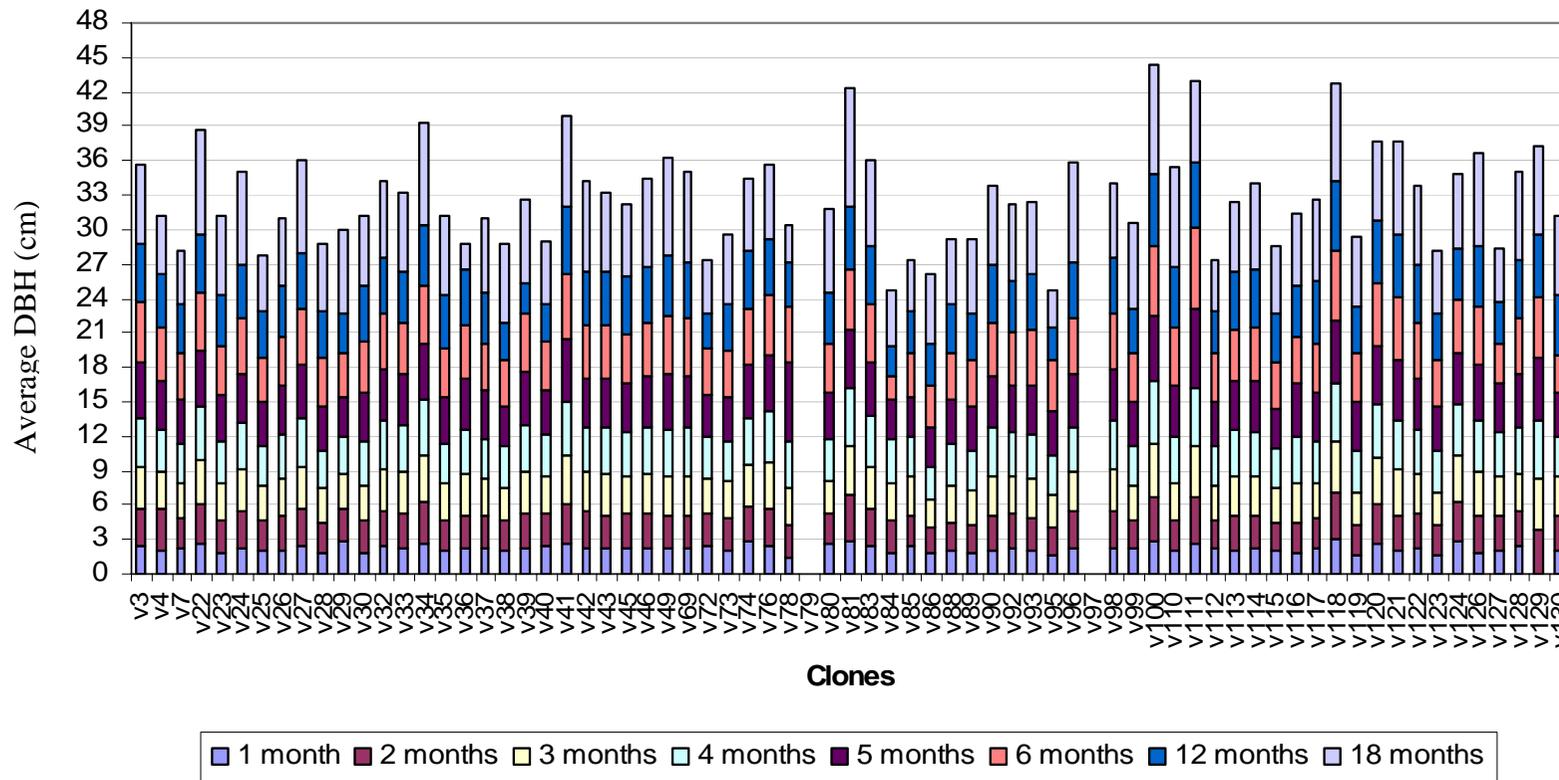


Figure 22 Average DBH of sprouts at the ages of 1, 2, 3, 4, 5, 6, 12 and 18 months, coppicing from 71 clones at Clone Bank, Uthai Thani.

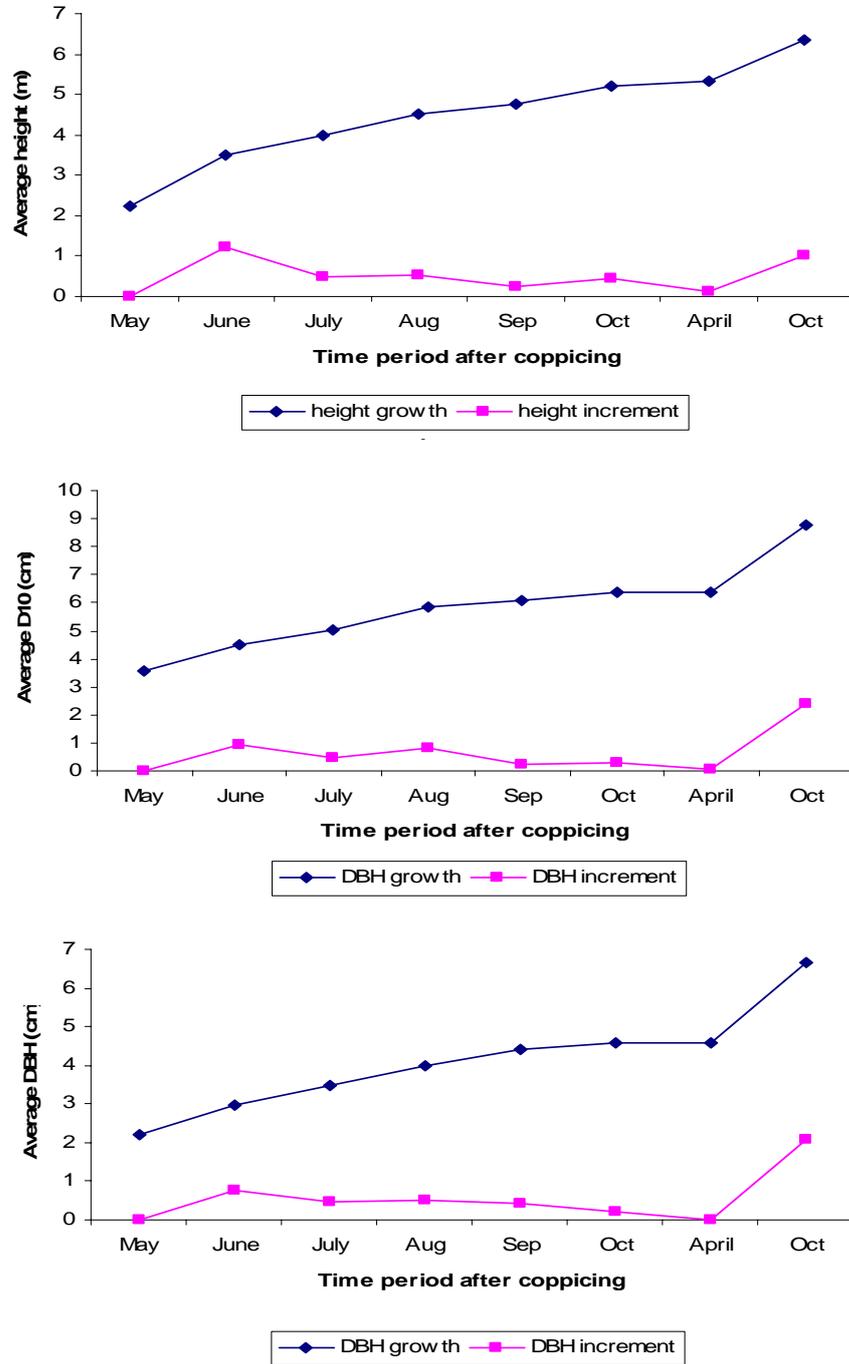


Figure 23 Total average and increment of height, D_0 and DBH of all sprouts coppicing during May 2005-October 2006 at Clone Bank, Uthait Thani.

Table 29 Average height growth of grafts and sprouts generated from the same clone set at Clone Bank, Uthai Thani

Clones	Average height (m) in various ages							
	3 months		6 months		12 months		18 months	
	ramet	sprout	ramet	sprout	ramet	sprout	ramet	sprout
V3	1.54	4.53	2.33	5.64	4.18	5.88	6.01	6.83
V4	1.06	3.59	1.64	4.92	3.14	5.02	5.22	6.62
V24	1.07	4.46	-	5.61	-	5.63	-	7.35
V25	0.82	3.59	-	4.52	-	4.64	-	6.13
V26	1.16	3.71	-	4.65	-	4.64	-	5.98
V28	1.14	3.51	1.44	4.60	2.79	4.76	4.54	6.11
V29	1.41	2.98	1.08	4.49	2.22	4.44	3.60	5.42
V30	1.11	3.70	1.82	5.11	3.36	4.95	5.82	5.95
V32	1.61	4.36	-	5.93	2.97	5.96	3.96	6.54
V34	1.29	4.93	1.62	6.28	2.85	6.53	4.45	7.73
V35	1.45	3.80	1.91	4.51	3.06	3.81	4.45	6.65
V36	1.37	3.99	1.66	5.52	3.00	5.59	4.76	5.86
V37	1.72	3.82	2.08	5.24	3.75	5.62	5.27	6.86
V38	1.45	3.52	-	4.48	-	4.01	-	4.70
V39	1.39	4.21	1.85	6.07	3.21	3.05	5.52	4.11
V40	1.61	3.62	1.97	4.52	3.47	3.83	5.00	5.53
V41	1.39	4.23	1.83	5.76	3.33	5.82	4.81	7.53
V42	1.28	4.41	2.56	5.55	3.97	6.06	5.70	7.57
V43	1.62	4.28	2.12	5.74	3.11	6.08	4.45	6.84
V45	1.62	4.76	2.13	5.84	2.97	7.02	3.96	8.40
V46	1.62	3.85	2.61	5.64	-	6.28	4.98	7.80
V49	1.12	3.69	2.00	5.10	3.07	5.59	4.79	7.39
V69	1.54	3.74	2.02	5.20	3.84	5.35	5.56	6.69
V72	1.19	3.40	2.20	4.20	3.55	3.06	5.16	4.72
V73	1.37	3.61	2.08	4.66	4.31	4.81	5.92	6.49
V74	1.42	3.85	2.59	5.39	3.96	5.41	5.79	6.65
V76	1.38	4.12	1.63	5.96	3.07	5.72	4.90	6.45
V78	1.02	3.50	2.30	5.10	3.34	2.94	4.64	3.72
V80	1.00	3.43	2.19	4.88	3.11	5.27	4.79	7.35
V81	0.97	4.88	2.18	6.24	3.21	6.69	4.77	6.91
V83	1.38	4.46	2.04	6.06	3.40	6.40	5.28	7.20
V84	1.70	3.30	2.19	1.81	3.06	3.00	4.44	4.80
V90	1.02	3.27	1.67	5.03	2.79	5.31	4.03	7.20
V92	1.17	3.56	-	5.01	-	5.19	-	5.70
V93	1.41	4.48	1.66	6.15	2.89	7.00	4.54	4.70
V95	1.18	4.35	1.44	6.21	2.57	3.91	3.85	4.33
V96	1.27	4.24	1.95	5.91	3.22	6.13	4.82	6.56

Table 29 (continued)

Clones	Average height (m) in various ages							
	3 months		6 months		12 months		18 months	
	ramet	sprout	ramet	sprout	ramet	sprout	ramet	sprout
V99	1.82	3.91	2.57	4.20	3.74	5.02	5.613	6.60
V100	1.75	5.01	-	6.98	-	7.27	-	8.40
V111	1.33	3.75	-	3.57	-	5.61	-	6.03
V112	1.64	3.45	-	3.93	-	4.38	-	4.95
V113	1.33	4.03	-	5.39	-	5.70	-	5.64
V114	1.42	4.04	1.42	5.68	2.35	6.08	3.83	5.83
V115	1.42	3.76	1.98	5.17	3.24	5.10	4.92	6.38
V116	1.16	3.95	2.10	5.09	3.05	5.32	4.90	6.63
V117	1.24	3.92	1.78	5.26	2.62	5.53	3.34	6.89
V118	1.86	4.34	2.15	5.33	3.07	5.79	4.92	8.00
V119	1.66	3.62	-	5.14	-	4.68	-	5.65
V120	1.52	5.19	-	6.67	-	6.93	-	7.20
V121	1.85	4.02	2.55	6.12	3.85	6.25	5.73	6.90
V122	1.53	3.60	2.53	5.14	3.91	5.22	6.41	6.11
V123	1.66	4.38	-	5.39	-	5.39	-	5.84
V124	1.33	4.13	2.16	5.57	3.14	5.60	5.23	5.97
V126	1.70	4.50	1.78	6.25	2.91	6.48	4.86	7.33
V127	1.54	4.27	2.03	4.64	3.11	5.03	4.46	5.14
V128	1.76	4.03	2.19	5.38	3.31	5.45	4.52	6.82
V129	1.63	4.90	2.14	6.30	3.11	6.86	4.75	6.07
V130	1.77	3.24	2.5	4.10	3.49	6.67	5.24	7.03
Average	1.41	4.00	2.01	5.26	3.24	5.38	4.88	6.36

- : No available data in the previous study

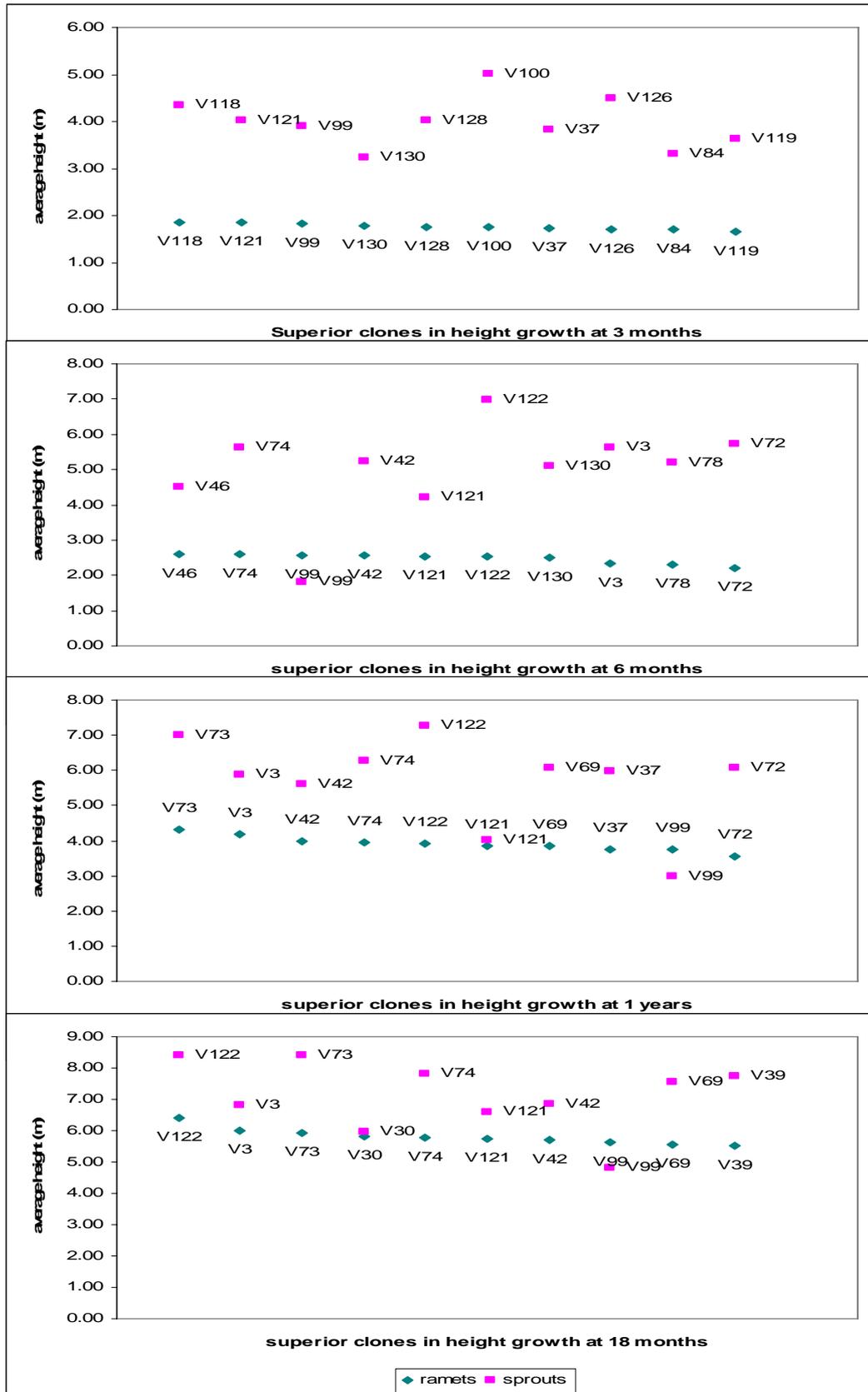


Figure 24 Comparison in height growth of 10 promising ramets and sprouts in various growth period at Clone Bank, Uthai Thani.