USE OF SHORT CUTS TO EXTEND LIFESPAN OF PB 260

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Owing to its attractive attributes, PB 260 was the most popular clone planted in a large Plantation Group in the 1990s. The clone however suffers from two major drawbacks which have caused its lifespan to be reduced to around 26 years instead of the norm of 30-33 years. In an attempt to prolong the lifespan of trees, basal virgin panels were exploited on short cuts combined with stimulation. In theory the 1/3Sd4 system could provide an additional panel for tapping and thereby extend lifespan of trees by 6 years while the 1/4Sd4 system could prolong lifespan of trees by 12 years from the two additional panels available for tapping compared with the standard 1/2Sd4 system.

Four trials were laid down to evaluate the use of short cuts in extending lifespan of PB 260 and also yields obtained thereof from the short cuts. Yields of short cuts in commercial area were also collated.

The 1/3Sd4 cum stimulation system yielded around 92-93 percent of the 1/2Sd4 control on panel BO1 in two trials. The 1/4Sd4 cum stimulation system yielded 85 percent of 1/2Sd4 control on panel BO1 in one trial. On change over to pane BO2 in one trial, the 1/3Sd4 cum stimulation system yielded 97 percent of 1/2Sd4 control. In commercial areas, mean yield per hectare of the 1/3Sd4 cum stimulation system was 1652 kg in the first year progressing to 2117 kg in the fourth year on panel BO1. The corresponding yield per tapper at 37 kg and 42 kg may be considered high, due mainly to an increase in task size.

In two trials on panel BO2 of trees previously tapped on 1/2S length of cut on panel BO1, the1/4S system gave satisfactory to high yield initially but tended to drop significantly as the tapping cut approached the union. In a commercial area, this drop in yield was arrested by joining the two 1/4S cuts to form a 1/2S cut.

Panel dryness in the short cut treatments was higher than their respective 1/2S controls in all four trials due probably to the effect of stimulation. The stimulation regime would have to be reduced in commercial areas to minimize incidence of panel dryness.

Using the short 1/3S system, lifespan of PB 260 may be prolonged by 6 years on basal virgin bark. On the panel changing 1/4S subsequently joined to form a 1/2S, lifespan may be extended by 3 years on panel BO2. In the same token, panel BO1 may also be extended by 3 years if initially tapped on the 1/4S cut, giving a total of 6 years on basal virgin panel. Task size may be increased for both short cut systems. This would result in higher yield per tapper which would lead to higher wages for tappers.

Keywords : PB 260, extension of lifespan, short cuts, extra panels.

PB 260 was the most popular clone planted in a large plantation group in the 1990s due to several attractive attributes of the clone (Chan, 1997). The clone shows good vigour during immaturity, has above average resistance against major leaf diseases, yields precociously and also has high timber yield due to its straight trunk with light self shedding branches.
The clone however has two major drawbacks, which are its propensity to panel dryness (Chan, 1996) and its poor yield on renewed bark. The latter has been observed to be due to poor renewed bark resulting from `wounding` of the fairly thin virgin bark (Chan, 2004, pers. comm.).

Chan, (1997) estimated a total lifespan of 26 years for the clone if exploitation were confined to virgin panels only, which is shorter than the norm of 30 -33 years for clones where renewed bark can be exploited. Chan and Ong (2000) proposed the use of short cuts on PB260 to provide additional panels whereby lifespan of trees could be prolonged. Task size can also be enlarged with use of short cuts, thereby reducing labour for tapping.

This paper reports results of four trials on short cuts, the objectives of which were to determine the additional period of tapping conferred on basal virgin panels as well as to evaluate the short cuts for commercial implementation.

MATERIALS AND METHOD

Trial details and treatments.

Trial details are given in Tables 1 and 2. All four trials were laid down on clone PB260.

Trial RE 1

The field was planted in 1988 and opened in 1995 when 70 percent of trees attained a girth size of 50 cm measured from 150 cm from the ground. The trial commenced at time of opening of trees in 1995. Treatments comprised the short 1/3S and 1/4S cuts for comparison with 1/2S control. Frequency of tapping was fourth daily. The short cuts were stimulated at 6 rounds of 1.5% ethephon per year. Stimulant was applied with a 1 cm brush on the inner side of the tapping cut between the renewed bark and groove. Trees were opened at a height of 150 cm from the ground. Slope of cut was 40^0 for the 1/3S and 1/4S cuts and 33^0 for the 1/2S control.

Trial RE 2

The field was planted in 1990 and opened in 1996 at the same opening standard as *Trial RE1*. The trial commenced at time of opening of trees in 1996. Treatments comprised the short 1/3S cut for comparison with 1/2S control. Frequency of tapping was fourth daily. The 1/3S cut was stimulated at 6 rounds of 1.5% ethephon per year. Trees were opened at a height of 150 cm from the ground. Slope of cut was 40^0 for the 1/3S cut and 33^0 for the 1/2S cut.
Panels were changed over to BO2 in 2002 and the same treatments were retained. The stimulation regime remained at 6 rounds x 1.5% ethephon.

Trial RE 3

The trial was set up as a follow- up on *Trial RE1* with enlargement of task size for the short cut system. The field was planted in 1988 and opened in 1995. Trees were commercially exploited on 1/2Sd3 tapping system on panel BO1.
The trial commenced in 2001 when panels were changed over to BO2. Four tasks with similar yield history and also located on similar terrain were selected for tapping on the short 1/4S cut. The 1/2S cut was marked out on panel BO2 at a slope of 40^0 and divided into two equal halves to obtain the 1/4S cut. Tapping commenced on the left panel, alternating with the right panel every 6 months. Stimulant was applied with a 1 cm brush on the inner side of the tapping cut between the renewed bark and groove. Another two tasks were selected and tapped 1/2S at a slope of 33^0. Frequency of tapping of the treatment plots was fourth daily. Task size of the 1/4Sd4 system was enlarged to 700 trees compared with 529 trees for the 1/2Sd4 system.

Trial RE 4

The trial was set up as a follow- up on *Trial RE1*, with enlargement of task size for the short cut system.
The field was planted in 1990 and opened in 1996. Trees were commercially exploited on 1/2Sd3 tapping system on panel BO1 prior to commencement of trial.
The trial commenced in 2001 when panels were changed over to BO2. Four tasks with similar yield history and also located on similar terrain were selected for tapping on the short 1/4S cut. The 1/2S cut was marked out on panel BO2 at a slope of 40^0 and divided into two equal halves to obtain the 1/4S cut. Tapping commenced on the left panel, alternating with the right panel every 6 months. Stimulant was applied with a 1 cm brush on the inner side of the tapping cut between the renewed bark and groove. Another two tasks were selected and tapped 1/2S at a slope of 33^0. Frequency of tapping of the treatment plots was fourth daily. Task size of the 1/4Sd4 system was enlarged to 750 trees compared with 600 trees for the 1/2Sd4 system.

MEASUREMENTS AND YIELD RECORDING

Yield

Yield recording was carried out at every tapping. Yield was weighed separately for latex and cuplump. Dry rubber content (drc) of latex was determined with a metrolac at every recording. Drc of cuplump was calculated assuming water content to be 50 per cent. Yield per hectare was computed based on 80 tappings per year for fourth daily frequency as tapping was also carried out on the weekly day of rest in high yielding months.

Bark consumption

Bark consumption was measured annually. The difference between the height of the proximal end of the tapping cut at the beginning and end of 12 months constituted the amount of bark consumed for the year.

Panel dryness

A census of dry tapping cuts was conducted annually. Only totally dry cuts were considered as `dry` for each respective panel.

Commercial areas exploited on short cuts

Yield and other related statistics were extracted from estate records and summarized accordingly. Fields tapped on the short 1/3Sd4 + stimulation system on panel BO1 and the 1/4Sd4 system on panel BO2 were selected for the exercise.

RESULTS

Yield and panel dryness

Trial RE1

Yield and panel dryness are given in Tables 3 and 4.
Mean yield per hectare over six years on panel B01 for 1/3Sd4 + stimulation and 1/4Sd4 + stimulation systems were 1553 kg and 1445 kg respectively. The corresponding mean yield per tapper were 28.1 kg and 26.2 kg. Yields were lower than 1/2Sd4 control by 8 percent for 1/3Sd4 + stimulation and 15 percent for 1/4Sd4 + stimulation. The 1/4Sd4 + stimulation tended to show a sharp drop in yield in the sixth year of tapping.
Cumulative panel dryness exceeded 10 percent for all treatments at the end of six years, being highest for the 1/4S4 + stimulation at 16.2 percent, followed by 1/3Sd4 + stimulation at 14.1 percent. Incidence of dryness of 1/2Sd4 control was 13.5 percent.

Trial RE 2

Yield and panel dryness on panel are given in Tables 5 and 6.

Mean yield per hectare of the 1/3Sd4 + stimulation treatment over six years on panel BO1 at 1684 kg was 93 percent of 1/2Sd4 control. Mean yield per tapper was 30.6 kg for 1/3Sd4+ stimulation compared with 32.7 kg for 1/2Sd4 control.
Panel dryness of the 1/3Sd4+ stimulation treatment was higher at 10.8 percent compared with 7.0 percent for 1/2Sd4 control.
On change-over to panel BO2, mean yield per hectare over 3 years of the 1/3Sd4 system at 1894 kg was 3 percent lower than 1/2S d4 control. Yield per tapper was around 35.0 kg (Tables 7) for the short cut. Panel dryness for both treatments were similar at around 8.0 percent.

Trial RE 3

Yield and panel dryness are given in Tables 9 and 10.

Mean yield per hectare of the 1/4Sd4 + stimulation treatment over 4 years on panel BO2 at 1686 kg was 88 percent of 1/2Sd4 control. Mean yield per tapper of the short cut treatment at 36.5 kg was however 17 percent higher than 1/2Sd4 control. Yield per hectare showed a sharper drop in the third and fourth year for the short cut compared with the 1/2S control.
Panel dryness of the short cut treatment at 16.2 percent was 2.3 percent higher than 1/2Sd4 control.

Trial RE 4
Yield and panel dryness are given in Tables 11 and 12.

Mean yield per hectare of the 1/4Sd4 treatment over 4 years on panel BO2 at 1877 kg was 89 percent of 1/2Sd4 control. Mean yield per tapper was however 11 percent higher than 1/2Sd4 control.
Panel dryness of both 1/2Sd4 control and 1/4Sd4 + stimulation treatments was less than 10 percent, being slightly higher for the short cut system at 9.9 percent.

Bark Consumption

Bark consumption was generally around 19 – 23.0 cm per year for both the short cuts and 1/2S cuts in the trials on panel BO1. There was a tendency for bark consumption to increase slightly as cuts approached the union due to greater difficulty in tapping. For the trials on panel BO2 where the short 1/4S cut was changed over every 6 months, actual combined length of bark consumed was only around 56 percent of the 1/2S cut.

DISCUSSION

Overall, yield per hectare of short cuts with stimulation was lower than 1/2S control on both panels BO1 and BO2 in all four trials.
On panel BO1, yield per hectare of the 1/3S cut with stimulation was 92 percent of the 1/2S control in *Trial RE1* and 93 percent in *Trial RE2* over the full duration of exploitation of the panel. Yield of the1/4S cut with stimulation was 85 percent of the 1/2S control in *Trial RE1*. In absolute terms yield per ha of the 1/3S cut in *Trial RE2* at 1684 kg was 8.4 percent higher than for the same tapping system in *Trial RE1*, probably due to lower panel dryness in the former.
On change-over to panel BO2 in *Trial RE2*, yield per hectare of the short 1/3S cut was only 3 percent lower than the 1/2S control. This appears to be a compensatory effect whereby the lower yield of the 1/3S cut on the previous panel BO1 gave rise to higher dry matter production and therefore improved yield on the 1/3S cut on panel BO2 compared with the same system on panel BO1.

In *Trials RE3 and RE4* where panel BO1 was previously tapped on 1/2S, yield per hectare on panel BO2 exploited on the1/4S cut system was 88-89percent of the 1/2S control over the first four years of exploitation. As the drop in yield per hectare of the 1/4S cut in relation to 1/2S control was much sharper in the last two years on panel BO1in *Trial RE1*, it would appear likely that yield per hectare of the 1/4S cut could drop to around 85 percent of the 1/2S control by the end of the full panel on BO2. This appears similar to the percent yield difference between the 1/4S cut and 1/2S cut on panel BO1.

In terms of yield per tapper, the 1/4S cut with stimulation yielded higher than the 1/2S control by 17 percent in *Trial RE3* and 11 percent in *Trial RE4* due mainly to the larger task size in the short cut system. Whilst the labour agreement between the Malaysian Agricultural Producers Association and National Union of Plantation Workers (MAPA/NUPW) stipulates a maximum task size of around 600 trees for fields tapped on 1/2S cut length, it is silent on the size of task for cuts shorter than 1/2S. In the Group, commercial task sizes of 700-750 trees are not uncommon for the short cut systems on panels BO1 and BO2.

Some commercial fields have yielded very well on the short cuts on enlarged task size (Table14). On panel BO1, mean yield per hectare on the 1/3Sd4 + stimulation system ranged from 1652 kg in the first year to 2117 kg in the fourth year, although there was a drop to 1621 kg in the fifth year in one field. The corresponding mean yield per tapper was 37 kg and 42 kg dropping to 35 kg in the fifth year. On panel BO2 of trees where panel BO1 was previously tapped on 1/2Sd4, mean yield per hectare on the 1/4Sd4 + stimulation system ranged from 2203 kg in the first year to 1993 kg in the third year. The corresponding mean yield per tapper was 44 kg and 39 kg. It is interesting to note that in an area where the two 1/4S cuts were joined to form a single 1/2S cut, yield per hectare improved from 1463 kg to 1817 kg.

In all four trials, panel dryness in the short cut treatments was higher than in the 1/2S control due probably to the effect of stimulation. Chew *et al* (1995) noted an increase in dryness with stimulation on clone PB235 while Chan *et al* (1983) and Gan *et al* (1989) also observed a similar phenomenon on older clones RRIM 600, GT1 and PR107.
With regard to panel dryness of clone PB 260, Chan (1996) proposed a tolerance limit for cumulative tree dryness at not more than 10 percent on panel BO1 and not more than 15 percent on panel BO2. Panel dryness in the short cut treatments on panel BO1 in *Trials RE1* and *RE2* ranging from 10.8 percent to 16.2 percent and 16.2 percent on panel BO2 in *Trial RE3* may be considered high. Panel dryness at 9.9 percent on panel BO2 in *Trial RE4* however may be considered acceptable. The lower panel dryness in *Trial RE4* than in *Trial RE3* is likely to be due to the deeper soil profile in the former. PB 260 generally suffers from a propensity to dryness (Chan ,1996) which also explains the fairly high dryness percentage in the unstimulated 1/2S control, especially in *Trials RE1* and *RE3*. For commercial areas, stimulation regime should perhaps be reduced to 4 rounds of 0.7% -1.5% ethephon per year on panel BO1 and 4 rounds of 1.5% ethephon on panel BO2 in an attempt to minimize panel dryness. A small decline in yield may have to be tolerated with the reduction in stimulation regime.

Length of bark consumed for the short cuts tapped continuously downwards on panel BO1 in *Trials RE1* and *RE2* was similar to the 1/2S control at around 21.0 cm. This would imply that additional panels would be available from the short cut systems. Thus theoretically, three panels would be available from the 1/3S cut and four from the1/4S cut on basal virgin bark compared with only two for the 1/2S cut.

Whilst lifespan of trees can indeed be lengthened by employing the short cut cum stimulation systems, the yields obtained should be equitable before these systems can be adopted commercially. On the basis of the trial and commercial results obtained, the 1/3Sd4 + stimulation system appears suitable for panel BO1 and probably also for panel BO2. Yield obtained for the 1/4Sd4 + stimulation system at 85% of 1/2Sd4 control on panel BO1 appears slightly low due mainly to sharply lower yields as the cut approached the union. However if the system can be modified to the 6 monthly panel changing system as in *Trials RE3* and *RE4*, the two 1/4S cuts may be joined to revert to 1/2S to arrest the yield decline when the cut approaches the union.

In summary, the 1/3Sd4 cum stimulation system can be adopted for the basal virgin panels of clone PB 260 as satisfactory to high yields may be obtained. The panel changing 1/4S cum stimulation system, later to revert to 1/2S as the cut approaches the union, may also be adopted for the same basal panels. Stimulation should be reduced to 4 rounds of 0.7% -1.5% E on panel BO1 and 4 rounds of 1.5%E on panel BO2 for both the short cut systems to minimize panel dryness.

Lifespan of PB260 may be prolonged by 6 years on the short 1/3S system. On the panel changing short 1/4S, subsequently joined to form a 1/2S lower down the panel, lifespan may be extended by 3 years on panel BO1 and another 3 years on panel BO2, giving a total of 6 years. Task size may be increased for both short cut systems. This would result in higher yield per tapper which would lead to higher wages for tappers.

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TABLE 1
LOCATION AND OTHER DETAILS OF TRIALS ON SHORT CUTS ON PB 260

Trial number	*Location*	*Year planted*	*Year opened*	*Commencement of trial*
RE1	Rantau, N. Sembilan	1988	1995	1995
RE2	Lanchang, Pahang	1990	1996	1996
RE3	Dabong, Kelantan	1988	1995	2001
RE4	K. Lipis, Pahang	1990	1996	2001

TABLE 2
TREATMENTS AND OTHER DETAILS OF TRIALS ON
SHORT CUTS ON PB 260

Trial	*Panel*	*Treatment*	*Replication*	*Trees per task*	*Trees per ha*
RE1	BO1	1. 1/2Sd4 - control 2. 1/3Sd4+ 1.5%E x 6 3. 1/4Sd4+ 1.5%E x 6	2 4 4	580 580 580	400 400 400
RE2	BO1	1. 1/2Sd4 - control 2. 1/3Sd4+ 1.5%E x 6	4 4	585 585	403 403
	BO2	1. 1/2Sd4 control 2. 1/3Sd4+1.5%E x 6	4 4	572 572	390 390
RE3	BO2	1. 1/2Sd4 - control 2. 1/4Sd4 +1.5%E x 6	2 4	529 700	404 404
RE4	BO2	1. 1/2Sd4 - control 2. 1/4Sd4 +1.5%E x 6	2 4	600 750	434 434

TABLE 3
TRIAL RE 1: YIELD OF SHORT CUTS ON PANEL BO1

Treatment	*Year*													
	kg per tapper							*kg per ha*						
	1	2	3	4	5	6	*Mean*	1	2	3	4	5	6	*Mean (%)*
1/2Sd4 – Control	24.2	29.2	36.1	35.6	30.7	27.8	30.6	1335	1610	1991	1963	1693	1533	1687 (100)
1/3Sd 4 + 1.5% E x 6	22.9	28.4	31.4	32.1	27.8	26.3	28.1	1263	1566	1731	1770	1533	1450	1553 (92)
1/4Sd4 + 1.5% E x 6	21.3	27.1	29.4	30.8	27.0	21.6	26.2	1175	1495	1621	1699	1489	1191	1445 (85)

TABLE 4
TRIAL RE 1: CUMULATIVE DRYNESS PERCENTAGE ON PANEL BO1

Treatment	*Year*					
	1	2	3	4	5	6
1/2Sd4 - Control	1.9	2.9	5.0	8.8	11.6	13.5
1/3Sd4 + 1.5% E x 6	2.4	4.1	5.8	9.7	12.0	14.1
1/4Sd4 + 1.5% E x 6	1.6	3.6	6.1	10.6	14.2	16.2

TABLE 5
TRIAL RE 2 : YIELD OF SHORT CUT ON PANEL BO1

Treatmt	*Year*													
	kg per tapper							*kg per ha*						
	1	2	3	4	5	6	*Mean*	1	2	3	4	5	6	*Mean (%)*
1/2Sd4 – Control	23.2	36.3	38.9	33.5	31.6	32.8	32.7	1277	2000	2143	1845	1741	1807	1802 (100)
1/3Sd4 + 1.5% E x 6	21.5	31.8	38.1	33.0	31.2	28.1	30.6	1173	1751	2099	1818	1718	1547	1684 (93.)

TABLE 6
TRIAL RE2 : CUMULATIVE DRYNESS PERCENTAGE ON PANEL BO1

Treatment	*Year*					
	1	2	3	4	5	6
1/2Sd4 - Control	1.8	3.4	4.6	5.3	6.5	7.0
1/3Sd4 + 1.5% E x 6	1.7	5.4	7.1	8.8	10.0	10.8

TABLE 7
TRIAL RE 2: YIELD OF SHORT CUTS + STIMULATION ON PANEL BO2

Treatment	*Year*							
	kg per tapper			*Mean*	*kg per ha*			*Mean* (%)
	1	2	3		1	2	3	
1/2Sd4 Control	41.2	35.6	30.6	35.8	2247	1941	1669	1952 (100)
1/3Sd4 + 1.5% E x 6	38.8	37.3	28.1	34.7	2116	2034	1532	1894 (97.0)

TABLE 8

TRIAL RE 3: CUMULATIVE DRYNESS PERCENTAGE ON PANEL BO2

Treatment	*Year*		
	1	2	3
1. 1/2Sd4 Control	4.5	5.5	7.9
2. 1/3Sd4 + 1.5% E x 6	3.9	5.0	8.1

TABLE 9
TRIAL RE 3:YIELD OF 1/4SD4 + STIMULATION ON PANEL BO2

Treatment	*Year*									
	kg per tapper				*Mean*	*kg per ha*				*Mean*
	1	2	3	4	*(%)*	1	2	3	4	*(%)*
1/2Sd4 Control	36.5	32.6	29.4	26.5	31.2(100)	2229	1991	1795	1621	1909(100)
1/4Sd4 + 1.5% E x 6	45.5	38.1	32.5	30.2	36.5(117)	2094	1759	1500	1394	1686(88)

TABLE 10

TRIAL RE 3: CUMULATIVE DRYNESS PERCENTAGE ON PANEL BO2

Treatment	Year			
	1	2	3	4
1. 1/2Sd4 Control	4.8	8.6	11.1	13.9
2. 1/4Sd4 + 1.5% E x 6	5.9	10.2	13.4	16.2

TABLE 11

TRIAL RE 4: YIELD OF 1/4SD4 + STIMULATION ON PANEL BO2

Treatment	*Year*									
	kg per tapper				*Mean*	*kg per ha*				*Mean*
	1	2	3	4	*(%)*	1	2	3	4	*(%)*
1/2Sd4 – Control	39.2	38.1	36.2	32.0	36.3 (100)	2266	2202	2092	1849	2102 (100)
1/4Sd4 + 1.5% E x 6	45.5	42.5	39.5	34.8	40.5 (111)	2103	1967	1828	1610	1877 (89)

TABLE 12
TRIAL RE 4: CUMULATIVE DRYNESS PERCENTAGE ON PANEL BO2

Treatment	Year			
	1	2	3	4
1. 1/2Sd4 Control	1.8	2.8	4.9	7.8
2. 1/4Sd4 + 1.5% E x 6	2.0	3.2	6.5	9.9

TABLE 13
BARK CONSUMPTION (CM) IN THE VARIOUS TRIALS

Trial	*Treatments*	*Year*						
		1	2	3	4	5	6	*Mean*
RE 1	1/2Sd4 control	19.5	20.0	21.0	22.0	22.5	23.0	21.3
	1/3Sd4+stim	19.0	19.5	20.5	21.0	22.0	22. 5	20.8
	1/4Sd4+stim	19.0	19.0	20.0	21.0	21.5	22.0	20.4
RE 2	1/2Sd4 control	20.0	20.0	20.0	21.5	22.0	23.0	21.1
	1/3Sd4+stim	19.0	19.5	20.0	21.0	22.0	22.5	20.6
RE 3	1/2Sd4 control	20.0	20.0	21.0	21.5	*na*	*na*	20.6
	1/4Sd4+stim	11.0	11.5	12.0	12.0	*na*	*na*	11.6
RE 4	1/2Sd4 control	20.0	20.5	21.5	*21.5*	*na*	*na*	20.9
	1/4Sd4+stim	11.0	11.5	12.5	*12.5*	*na*	*na*	11.9

TABLE 14
YIELD OF SHORT CUTS IN COMMERCIAL AREAS OF PB 260 (KG /HA)

Panel	*Tapping System*	*Mean Task size (trees)*	*Year*				
			1	2	3	4	5
BO1	1/3Sd4 + 0.7%- 1. 5%E x 4-6	718	1652 (37)	2017 (40)	2193 (46)	2117 (42)	1621 (35)
Number of fields			6	5	3	3	1
Hectarage			312	297	190	190	54
BO2	1/4Sd4 + 1. 5%-E x 4-6	725	2203 (44)	2177 (42)	1993 (39)	n.a.	n.a.
Number of fields			5	5	3		
Hectarage			235	235	183		
BO2	1/4Sd4 + 1. 5%E x 4-6	703	2169	1947	1463		
	Converted to 1/2Sd4 + 1.5%E x 4	585				1817	
Number of fields			1	1	1	1	
Hectarage			45	45	45	45	

Figures in parenthesis denote kg per tapper
n.a.- not available