LEMBAGA GETAH MALAYSIA
MALAYSIAN RUBBER BOARD

INTERNATIONAL RUBBER RESEARCH & DEVELOPMENT BOARD

IRRDB

PROCEEDINGS OF

MRB-IRRDB WORKSHOP ON AGRONOMY AND TRANSFER OF TECHNOLOGY

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Low Frequency Tapping System Practice in India

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Area to be tapped in small holdings : 0.44 million ha
Available tappers, only : 0.08 million
Major frequency in small holdings : d2

Average age of tappers – above 50 years

Young generation is not interested to take up tapping as a profession.

There is acute shortage for skilled tappers in India.

- **Along with NR price rise during 2011-12 to INR 250 (USD 3.8), all other costs, specifically tapping wages increased considerably.**
- **In Jan, 2016 it declined to a level of INR 94 (USD 1.4), a price reduction of 62%.**
- **Due to high cost of living, tappers are not in a position to reduce wages.**

Rubber growers are in a dilemma

Due to small size of holdings - 0.54 ha -200+ trees- income from rubber only cannot support a family.

Many have other engagements – running small shops, sales person, teachers, office staff etc

Around 25% small growers already tap on their own, and their number is steadily increasing.

>80% of new entrants in tapping schools are learning tapping *for own use, a welcome change*

When they tap on their own why should they do it 3 times a week, if weekly one tapping assures the same crop.

Grower cannot fix NR price, but he can control his cost of production

@ Yield = 1500kg, 1$= INR66, 1 RM=INR 16.6

Tapping wage: INR800/day/ha (12.1$ or RM 48.2)

Tapping frequency : d2 - tapping days 150/yr
Total cost under d2 : INR 120000 (1818.2 $-RM7223)
Cost /kg (only tapping) : INR 80 (1.21$ -RM4.82)

Tapping frequency : d7 - tapping days 52/yr
Total cost under d7 : INR 53040 (803.6$-RM3195.2)
Cost /kg (tap,ET,incentive): INR 35.36 (0.54 $-RM2.13)
Cost reduction/kg rubber : INR 44.64 (0.68 $-RM 2.69)
Reduction in cost of production: 55.8% under d7

Reduction in expenditure through adoption of weekly tapping=INR 120000 – 53040 = INR 66960 (1014.5$-RM4033.7)

Conducted first long term Low Frequency Experiment in 30 ha area under d2 to d7 frequency with weekly one day off ,i.e. 6d/7.

Conducted second long term Low Frequency Experiment under d2 to d7 frequency, both under 6d/7 and 7d7.

1. Long term LFT trial results in clone RRII 105

Tapping system	Tapping days	Stim/year	Dry rubber yield -Kg	Kg/tap	Annual bark use
S/2 d2 6d/7	150	0	2100	14	23cm
S/2 d3 6d/7	**102**	**0**	**1706**	**17**	**17cm**
S/2 d3 6d/7	102	3	2200	22	17cm
S/2 d4 6d/7	**71**	**6**	**2172**	**31**	**15cm**
S/2 d7 6d/7 weekly	50	12	2350	47	13cm

Cumulative T P D after 13 years of trial – d2: 28%
(weekly tapping) d7: 8%

2. Comprehensive Research on LFT

A trial with all frequencies from d2 to d7
(with and without Sunday rest-6d/7 & 7d/7)

Treatments:

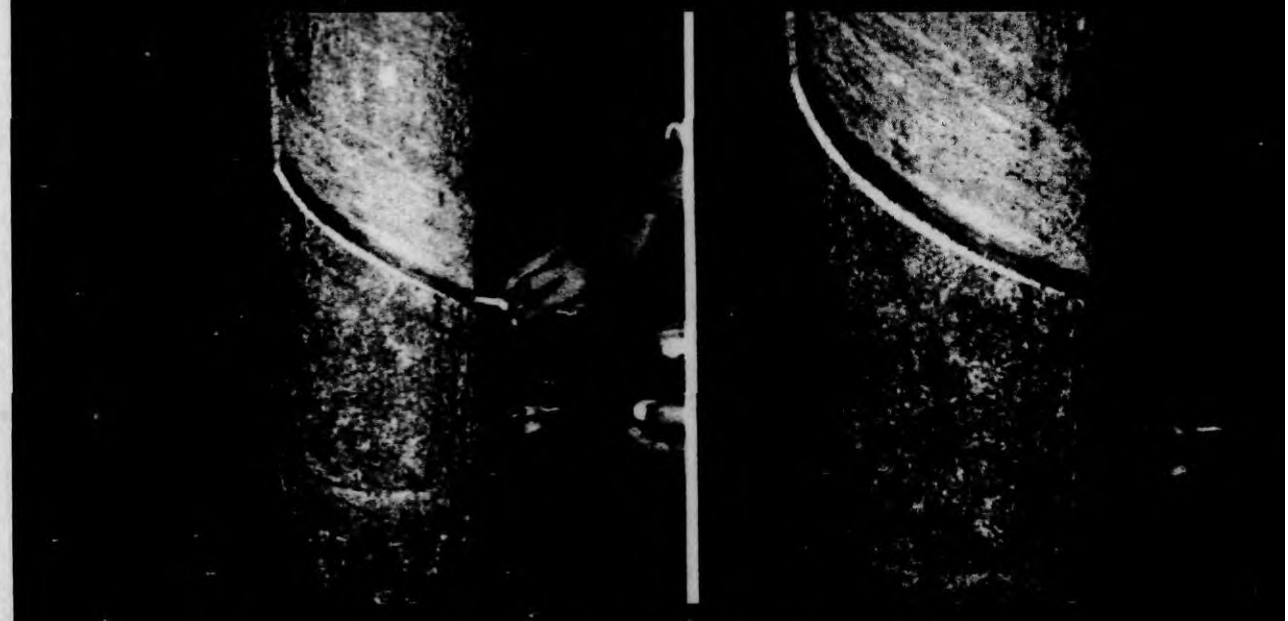
T0	**S/2 d2 6d/7**	**: Tapping days expected/year**	**: 150**
T1	**S/2 d3 6d/7**	**«**	**: 104**
T2	**S/2 d3 7d/7 ET 2.5% Pa 2/y***	**«**	**: 121**
T3	**S/2 d3 6d/7 ET 2.5% Pa 3/y***	**«**	**: 104**
T4	**S/2 d4 7d/7 ET 2.5% Pa 4/y***	**«**	**: 91**
T5	**S/2 d4 6d/7 ET 2.5% Pa 6/y***	**«**	**: 78**
T6	**S/2 d6 7d/7 ET 2.5% Pa 10/y***	**«**	**: 60**
T7	**S/2 d6 6d/7 ET 2.5% Pa 12/y * (m)**	**«**	**: 52**

In the first two years, yield stimulation for
*** T6 @ 3 weeks & for T7 @ 2 weeks, interval.**

Yield (kg/400 trees) under various tapping systems at HML Koney estate during April 2011 to March 2015

Tapping system	April, 2011 to Mar 2012	April, 2012 to March, 2013	April, 13 to March, 2014	April, 14 to March, 2015	Mean over 4 years
S/2 (RG) d2 6d/7	2090 a	2188 a	2124ab	2034c	2109 a
S/2 (RG) d3 6d/7	1671 c	1663 b	1949b	1626d	1727 b
2 (RG) d3 7d/7 ET 2.5% Pa 2/y*	2123 a	2220 a	2135ab	2048c	2132 a
S/2 (RG) d3 6d/7 ET 2.5% Pa 3/y*	1939 ab	1976 a	2238a	2054c	2052 a
S/2 (RG) d4 7d/7 ET 2.5% Pa 4/y*	1980 ab	1937 a	2313a	2162abc	2098 a
S/2 (RG) d4 6d/7 ET 2.5% Pa 6/y*	1857 bc	2109 a	2278a	2219ab	2113 a
S/2 (RG) d6 7d/7 ET 2.5% Pa 10/y*	1909 abc	2085 a	1942b	2081bc	2004 a
S/2 (RG) d6 6d/7 ET 2.5% Pa 12/y	1843 bc	2017 a	2213a	2254a	2082 a

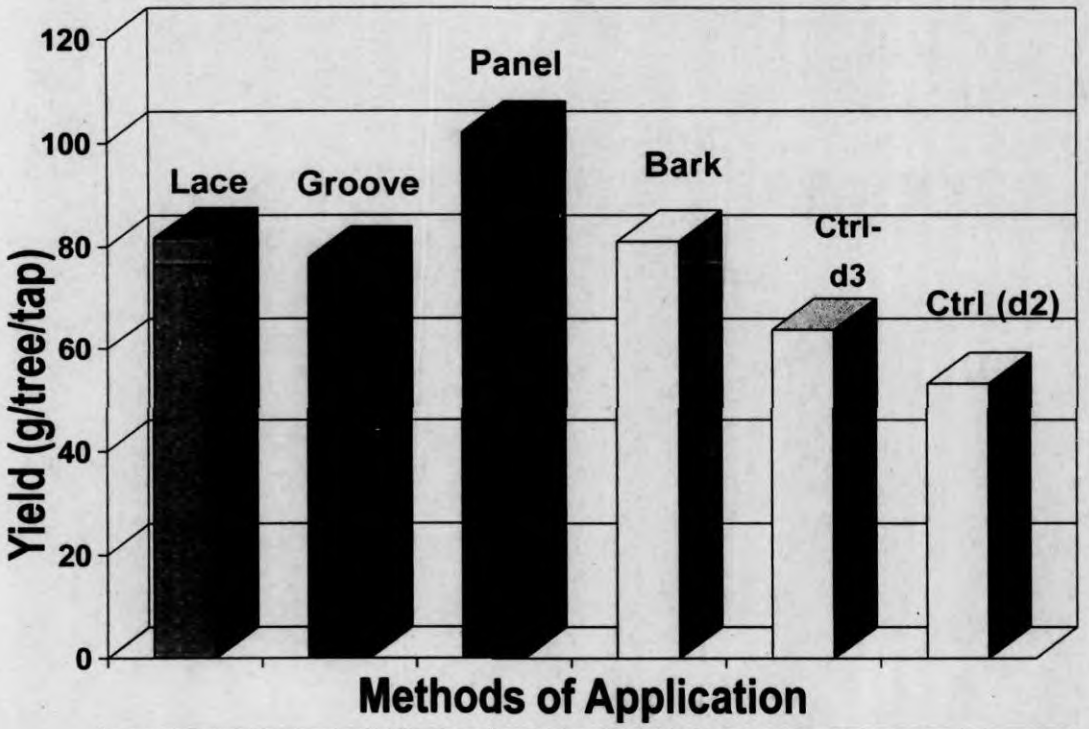
Panel application of Ethepon – 2.5%, 1.5cm width



Applying stimulant

Stimulated tree

Comparative effectiveness of different stimulation methods



Lace, Groove & Bark: ET 5% Panel : ET 2.5%

The analysis of biochemical data indicated

Balanced and activated metabolism in d4 7d/7 and d4 6d/7 with sufficient sucrose loading, high energy availability (ATP) and protection of laticiferous system

Tapping frequency d6 and d7 showed high utilization of sucrose after stimulation indicated by very low sucrose, high invertase activity, normal thiols and sufficient energy availability.

Though low, the level of sucrose is maintained throughout the experiment period under d6 and d7

No sign of degradation of the laticiferous system was observed under d6 and d7 with frequent stimulant application, indicated by high thiol, no accumulation of stress indicators like proline and phenol.

Latex Biochemical parameters in clone RRII 105 under different tapping frequencies and stimulation

Treatments	Sucrose (mM)				Thiols (mM)			
	May 11	Peak 11	Peak 12	Peak 13	May 11	peak 11	Peak 12	peak13
S2 d2 6d/7	11.9[a]	9.26[ab]	11.13a	10.35b	0.29	0.22b	0.327a	0.379a
S2 d3 6d/7	10.7[ab]	10.31a	8.14b	13.83a	0.28	0.20b	0.322a	0.263ab
S2 d3 7d/7	9.8[abc]	6.78[bc]	7.52b	6.49d	0.20	0.13c	0.197de	0.211c
S2 d3 6d/7	7.9[bcd]	4.94cd	7.04b	8.96bc	0.26	0.30[a]	0.289abc	0.271b
S2 d4 7d/7	6.6[cde]	5.42[c]	5.41cd	7.36cd	0.28	0.19[b]	0.256bc	0.255ab
S2 d4 6d/7	5.0[de]	4.25cd	4.89de	3.98e	0.25	0.22[b]	0.296ab	0.365a
S2 d6 7d/7	4.9[de]	3.82cd	3.36e	2.89e	0.18	0.14c	0.175e	0.242ab
S2 d7 6d/7	3.8e	2.14d	2.89e	2.99e	0.24 NS	0.18b	0.236cd	0.286b

Means followed by a common letter are not significantly different at $p \leq 0.05$

Latex Biochemical parameters in clone RRII 105 under different tapping frequencies and stimulation

Treatments	Proline (mM)				Phenol (mM)			
	May 11	Peak 11	Peak 12	Peak 13	May 11	peak 11	Peak 12	peak13
S2 d2 6d/7	0.61	0.97ab	1.06	1.33	0.66	0.75	1.013cd	1.2
S2 d3 6d/7	0.51	0.76bc	0.78	1.24	0.60	0.76	1.27abc	1.48
S2 d3 7d/7	0.58	1.12a	0.96	1.04	0.89	0.80	1.12bcd	1.78
S2 d3 6d/7	0.49	0.87abc	0.91	0.96	0.61	0.74	1.22bcd	1.43
S2 d4 7d/7	0.56	1.03ab	1.14	1.06	0.93	0.75	1.37ab	1.22
S2 d4 6d/7	0.63	0.96abc	0.95	1.07	0.70	0.78	0.93d	1.2
S2 d6 7d/7	0.60	1.06a	1.11	0.85	1.07	0.82	1.25ab	1.48
S2 d7 6d/7	0.66 NS	0.69c	0.88 NS	1.08 NS	0.67 NS	0.75 NS	1.11bcd	1.36 NS

Means followed by a common letter are not significantly different at $p \leq 0.05$

Latex Biochemical parameters in clone RRII 105 under different tapping frequencies and stimulation

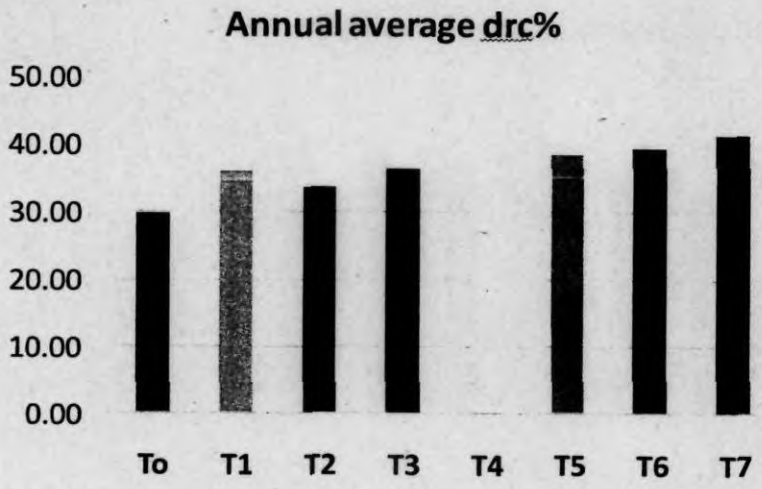
Treatments	ATP (µM)				Invertase activity(µM glucose liberated/min/mg protein)	
	May 11	Peak 11	Peak 12	Peak 13	Peak 12	Peak 13
S2 d2 6d/7	211.89	247.0c	259.6c	250.0c	186.76e	180.9e
S2 d3 6d/7	192.05	242.3c	231.2bc	249.1c	227.51d	220.6d
S2 d3 7d/7	187.89	301.2a	292.8b	304.2a	260.13cd	248.1d
S2 d3 6d/7	182.44	314.5a	282.4ab	314.6a	190.5e	196.7e
S2 d4 7d/7	190.9	311.3a	306.8a	314.8a	299.3b	296.1c
S2 d4 6d/7	191.9	324.0a	331.2a	313.9a	280.8bc	283.4c
S2 d6 7d/7	200.58	269.6b	296.1ab	274.1b	394.5a	381.2b
S2 d7 6d/7	207.51	246.3c	270.8b	247.9b	410.36a	401.8a

Means followed by a common letter are not significantly different at $p \leq 0.05$

Cumulative yield, yield kg tap^{-1}, yield cm $^{-1}$ bark used, TPD%, and annual girth increment under different systems

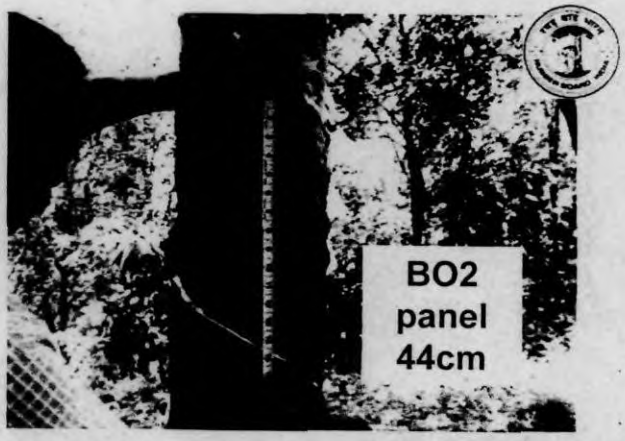
Treatment	Cum. Yield (kg) of 4 yrs	Yield (kg tap^{-1})	Cum. Yield (kg) discounted for TPD	Yield cm^{-1} bark used(kg)	Cum TPD % (4 yrs)	Annual Girth increment (cm)
T0 –d2 (0)	8435	11.1	6638	49.9	21.3	2.18
T1 – d3 (0)	6908	15.1	6031	51.7	12.7	2.08
T2 –d3 7d/7 (8)	8526	15.8	7588	63.7	11.0	2.43
T3 – d3 6d/7 (12)	8207	19.2	7690	62.0	6.3	2.26
T4 – d4 7d/7 (16)	8391	21.3	7661	64.2	8.7	2.6
T5 – d4 6d/7 (24)	8450	25.3	7580	73.5	10.3	2.07
T6 – d6 7d/7 (60)	8016	31.1 *	7455	85.3	7.0	2.66
T7 – d7 (72)	8327	37.6 *	7827	90.5	6.0	2.53

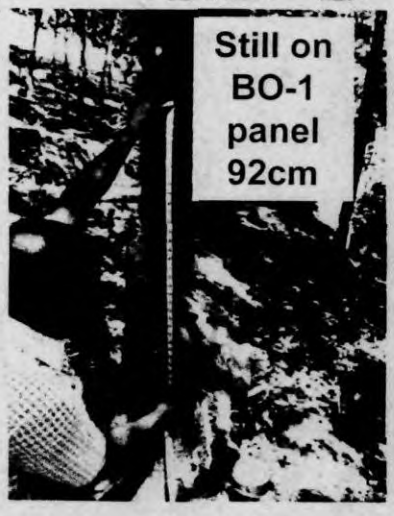
*** In estate sector highest benefit to tapper from d6 & d7**



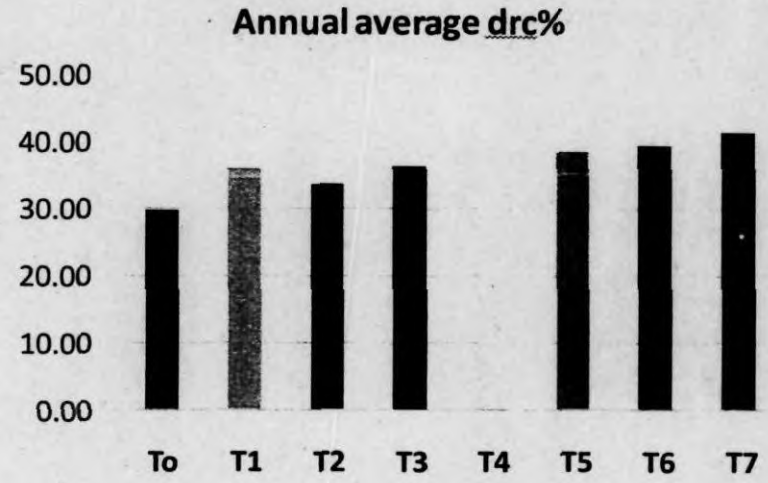
Annual average drc % is in the range of 29.9 (d2) to 41.6 (d7)

d2





d7



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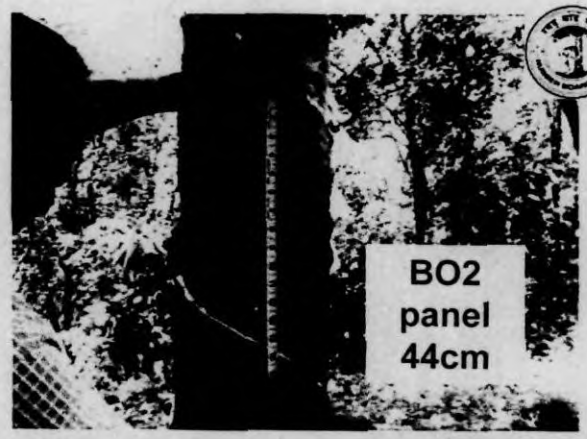
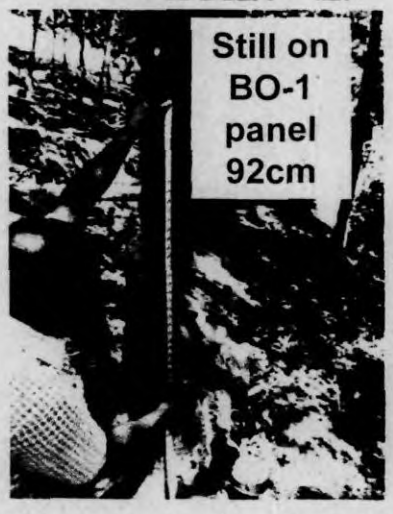
d2



2015



d7

Low Frequency Tapping : yield stimulation schedule for RRII 105

Clone	Tapping system	Rounds/ year	Schedule
RRII 105	S/2 d3 7d/7	2	April/May/June, September/ October/ November
RRII 105	S/2 d3 6d/7	3	April/May/June, September, November
RRII 105	S/2 d4 7d/7	4	April/May/June, August, October, December
RRII 105	S/2 d4 6d/7	6	April/May, June, August, September, November, December
RRII 105	S/2 d6 7d/7	10*	All months - after every 6th tapping, 72 hours before the 7th tapping
RRII 105	S/2 d6 6d/7 (weekly tapping)	12**	All months - after every 4th tapping, 72 hours before the 5th tapping

* During the initial two years of opening 20 rounds per year
** During the initial two years of opening 24 rounds/year

Low Frequency Tapping : yield stimulation schedule – other clones

Clone	Tapping system	Rounds/ year	Schedule
GT 1	S/2 d3 6d/7	4	April/May/June, August, October, December
GT 1	S/2 d4 6d/7	7	April/May/June, August, September, October, December, January
GT 1	S/2 d6 6d/7	15	Nov, Dec, Jan (monthly), remaining months - once in three weeks (after 3rd tap)
RRIM 600	S/2 d3 6d/7	4	April/May/June, August, October, December
RRIM 600	S/2 d4 6d/7	7	April/May/June, August, September, October, December, January
RRIM 600	S/2 d6 6d/7	15	Nov, Dec, Jan (monthly), remaining months - once in three weeks (after 3rd tap)
PB 217	S/2 d3 6d/7	3#	April/May/June, September, November
PB 217	S/2 d4 6d/7	5	April/May/June, August, October, December

\# No stimulation in first 2 years due to low drc

Appella estate, Karnatka. LFT d7 impact on crop over few years

Year	Annual yield	Kg tree^{-1}	Kg ha^{-1}
2011-12	73853	4.37	1748
2012-13	79509	4.70	1880
2013-14	79707	4.72	1888
2014-15	85357	5.05	2020
2015-16	89116	5.27	2108

Steady improvement of yield performance under weekly tapping

Clones - RRII 105 - 4648 trees (27.5%)
GT 1, RRIM 600 & PB 311- 12252 trees (72.5%)

weekly tapping at Kanthimathy estate, Tamil Nadu in clone RRII 105

Annual average bark consumption – 13 cm

Yield - over 2400kg ha^{-1}year^{-1}

TPD is very low –only 4%

One panel tapped for 10 years

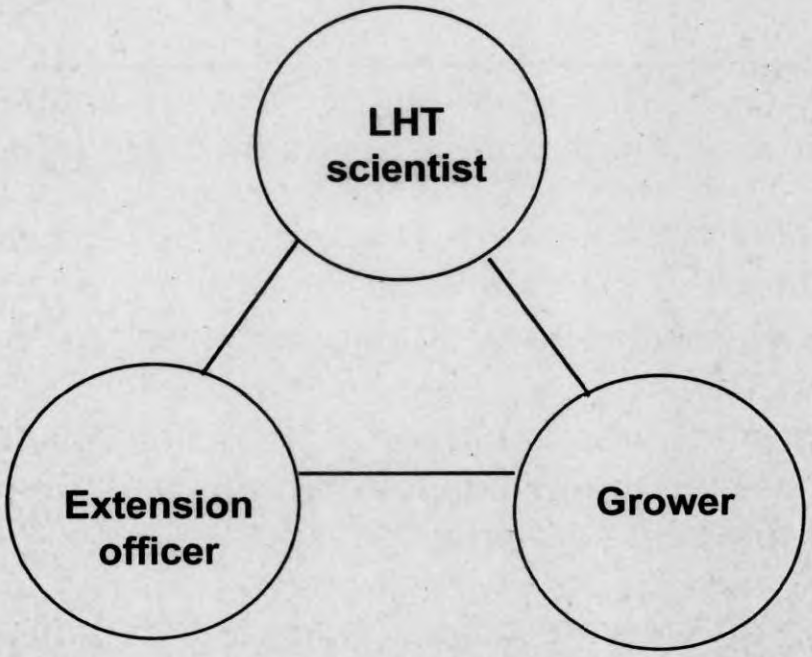
115 tapping blocks, only 16 tappers

Our efforts for large scale extension of LFT with yield stimulation

Major doubts of small growers

1. **Can I get equivalent crop of d2 frequency when I shift to LFT d3, d4 or d7?**
2. **Will there be high incidence of TPD due to repeated rounds of ethepon application?**

- **We conducted a collaborative program during 2009-13 on popularising LFT d3 with stimulation.**
- **One year campaign and subsequent extension activities was useful in removing fear of using ethepon on rubber trees from mind of growers.**
- **Grower to grower communication on the crop performance (no yield reduction), and very low incidence of TPD lead to confidence build up about our recommendations.**



Due to the earlier collaborative program on LFT d3 it was easy for us to get good number of participants to start LFT d7

We are now running a similar collaborative program on popularising LFT d7 among small holdings with active participation of our extension colleagues.
Certain problems in the initial days were solved through interactive research.
After one year the number of growers adopting d7 has shot up from two/Regional office to more than 50 under regional offices like Thalassery.

How to adopt d7 when number of trees are small like 300-400, and when grower depends on hired labour?

RPS can play a pivotal role. Organize 6 or 7 growers with one block or task each, go for tapping rotation using one skilled tapper. The concept of tapper bank.

How to adopt d7 when number of trees are 300-400, when grower tap themselves, but number is too high for self tapping on same day?

Depending on growers convenience and capability, divide into plots, eg. Kothamangalam

A typical small farmer/house wife with 366 trees divided trees into seven plots of 50+ tress, every day morning spends 30 minutes for tapping. Adoption of d7 ensures regular income and no burden of tapper. She learned tapping from Rubber Board school.

R.O & grower	Kg/tree	kg/400	Taps	Period	TPD Nos		Tapping
Kothamangalam					Old	New	
Manoj M Joseph							
d3	4.2	1680	58	May-Dec	1		hired
d7	4.3	1720	30	May-Dec	2		hired
Johnson/Lovely-d7							
Plot 1- 53 trees	6.6	2623	35	May - Dec			Self
Plot 2- 52 trees	6.3	2528	35	May - Dec	3		Self
Plot 3- 53 trees	5.6	2235	35	May - Dec	1		Self
Plot 4- 50 trees	5.0	1992	35	May - Dec	1		Self
Plot 5- 51 trees	6.5	2609	34	May - Dec			Self
Plot 6- 51 trees	6.3	2526	34	May - Dec	2		Self
Plot 7- 56 trees	5.5	2186	34	May - Dec	4		Self
Average	5.96	2385					

Five thump rules for Best Results under d7, ensure

- **Regular tapping –In case a regular days tapping got skipped, those trees should be tapped on next day.**
- **Apply ethepon 2.5% Pa, 72hrs prior to 5th tapping**
- **Bark shaving of each tapping should have 2.5mm thickness (thinner shaving will lead to partial opening of latex vessels, reduced yield). 52x2.5mm =13cm**
- **Ensure correct depth in each tapping (observed bark growth of 0.5 to 1mm in one week), if not will lead to shallow tapping whereby end up with low yield.**
- **Avoid missing of tapping – hence timely rainguarding & if needed miniguard. Ensure regular panel washing with fungicide to prevent panel diseases**

Grower marks the days of tapping in advance on a calendar to ensure regularity. He also indicates date of yield stimulation, 72hrs before 5th tapping.

For Best Results under d7, ensure

- **Regular tapping – if tapping is on Wednesday, repeat tapping on all Wednesdays of the year. In case a regular days tapping got skipped, those trees should be tapped on next day.**

Date	Maneesh Jose, Erattupetta RRII 105 430 trees				
	Latex	Scrap	Dry wt L	Dry wt S	Total
02.10.15	ET				
05.10.15	177	8			
12.10.15	190	12			
19.10.15	152	12			
26.10.15	140	24			
Total	659		276.8	33.6	310.4
30.10.15	ET				
02.11.15	210	6			
09.11.15	180	6			
16.11.15	177	36			
23.11.15	180	14			
27.11.15	ET				
30.11.15	226	24			
Total	973		408.7	51.6	460.3
07.12.15	177	5			
15.12.15	151	6			
21.12.15	135	35			
26.12.15	ET				
29.12.15	175	7	268	31.8	299.8

ET after 4 taps

ET after 4 taps

ET after 4 taps

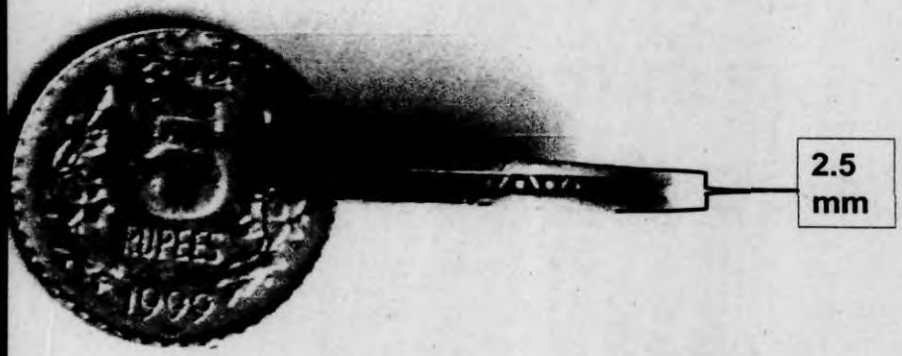
Adoor Chinnamma - 229 trees	Yield	Taps
June	10.5	1
July	68.4	5
Aug	64.9	4
Sept	65.1	4
Oct	0	0
Nov	16.8	3
Dec	56.6	4

Adoor	Yield(kg)
24.09.15	15.3
01.10.15	0
08.10.15	0
15.10.15	0
22.10.15	0
29.10.15	0
05.11.15	0
12.11.15	3.9
20.11.15	7.7
26.11.15	5.3

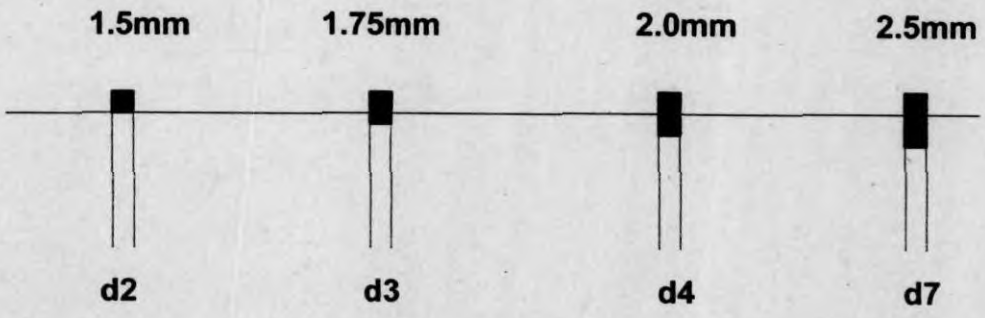
Irregular tapping will lead to complete crop loss of the untapped days, even has adverse carry over effect on next few taps yield

For Best Results under d7

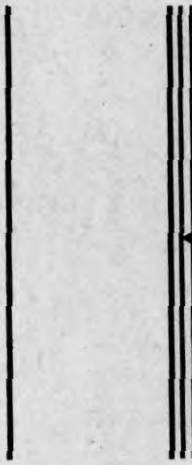
- Bark shaving of each tapping should have 2.5mm thickness (thinner shaving will lead to partial opening of latex vessels, reduced yield). 52x2.5mm =13cm



Compare thickness of bark shaving with that of the coin, occasionally



Required bark usage under various frequencies

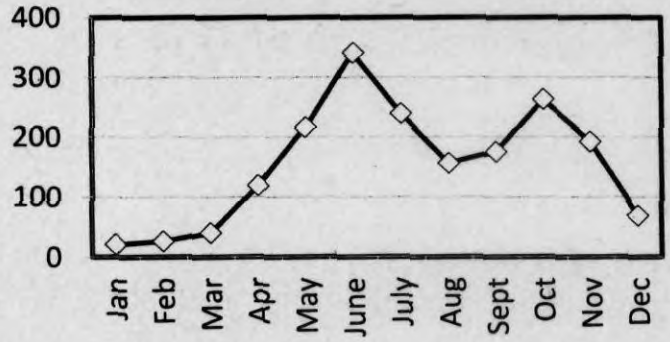


Renewed bark growth of 0.5 to 1mm in one week, hence during each tapping, depth of tapping should be constant.i.e. always upto 1mm near to cambium.

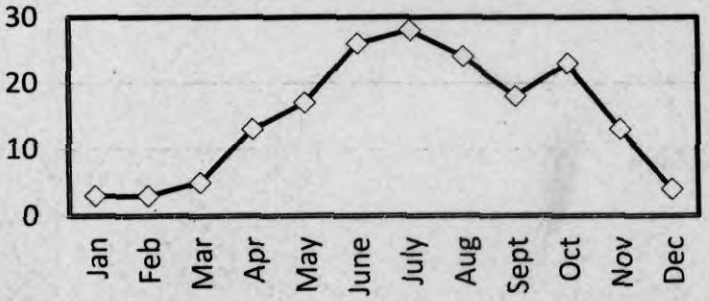
For Best Results under d7, ensure

- **Correct depth in each tapping (observed bark growth of 0.5 to 1mm in one week), if not will lead to shallow tapping whereby end up with low yield.**

Rainfall (mm) in Kerala-2015



Rainy days in Kerala -2015

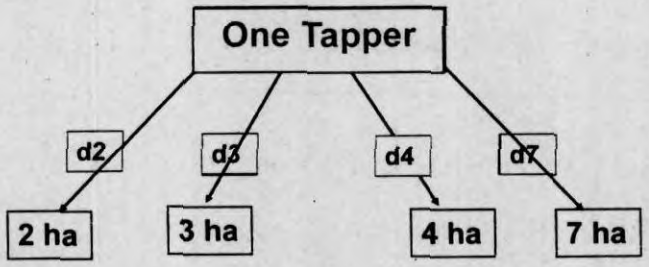


The two monsoons (6 months) warrants fool proof rainguarding. Bimodal pattern leads to bark growth in between, and hence chances of leakage is more. If needed, fix additional miniguard to prevent leakage and missing of tapping.

In addition to no loss in crop

- LFT have advantage of lower incidence of TPD
- Large timber volume
- Longer Economic life

(in d7, 10+10+21+3 =44 yrs, + 6 year immature)



Utilization of LFT for labour management

Other benefits are bonus

റബർ

2015 മേയ് 26 ചൊവ്വ

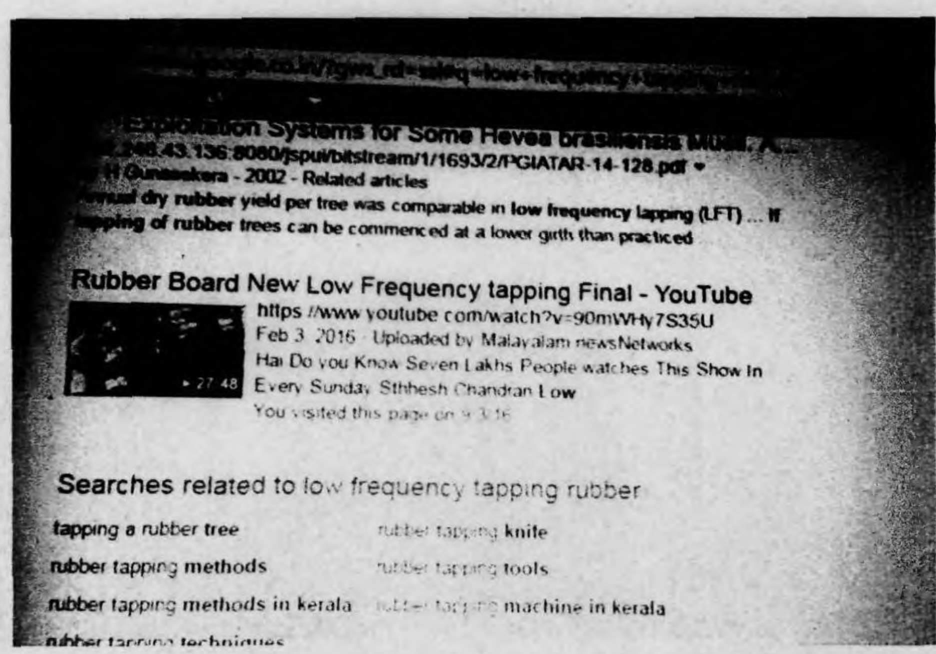
ചെലവ് കുറയ്ക്കാൻ, ഉൽപാദനം കൂട്ടാൻ പുതുവഴി

ഡോ. കെ. യു. തോമസ്

• ആഴ്ചയിൽ ടാപ്പിങ്

• നിയന്ത്രിത കമിഴ്ത്തിവെട്ട്

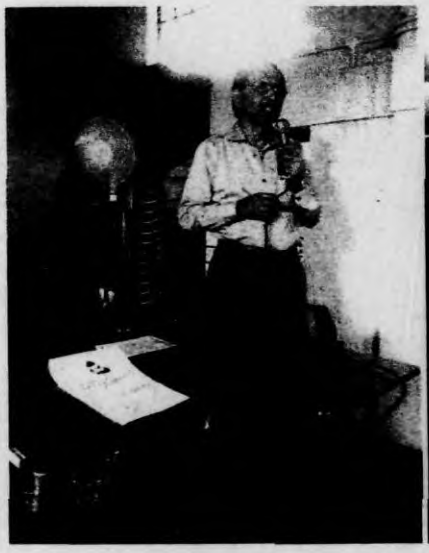
Article on weekly tapping and CUT in leading News paper Malayala Manorama dated May 26, 2015



We have made 30 minutes documentary exclusively on Low Frequency weekly tapping for popularizing it among small holdings. It was telecasted on 28.02.216
CD is given to extension officers for use in campaign meetings

Successful growers share their experience with others in grower meets

		വരവ്	
റൈൻ ഗാർഡിങ് -RG	8000	ഷീറ്റ് 1127@100	112700
മരുന്നു തളി -Spray	10000	ഒട്ടുപാൽ 400@60	24000
വളം -fertilizer	6700		
കാടുതെളിക്കൽ-weeding	3000		
ഉത്തേജന പ്രയോഗം-ET	2000		
ആസിഡ്-acid	500		
പട്ടകഴുകൽ-panel wash	1000		
ടാപ്പിംഗ് -tapping	23200/29		
ആകെ	**52400**	**1527kg**	**136700 +84300**



January 2016, even at very low price, growers assembling for interactive meeting on LFT

Grower meet in Northern Kerala

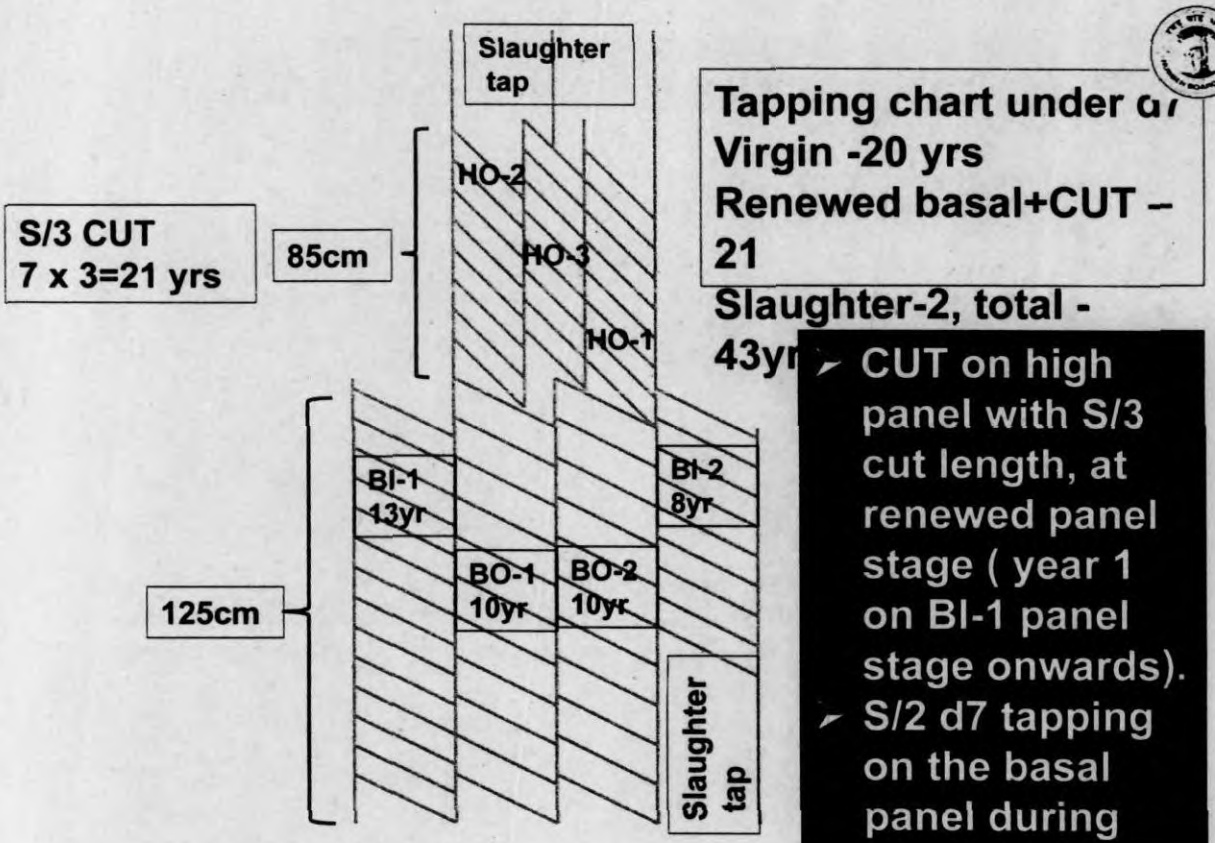
More than 500 small growers for an LFT seminar.
Over 90% is self tapping, Best target group for d7.
Some are already on d7, many are into d7 from 2016
Low rubber price, a catalyst for adoption of d7

Low price time is the best time to extent the most economical and best system of d7, on young as well as old trees under CUT

If LFT d7 is adopted from first year of tapping and CUT from renewed panel stage, economic life will be forty plus years.

The all out introduction of these two techniques can raise productivity by 200kg

Only one replanting in a growers life time against the current 2-3

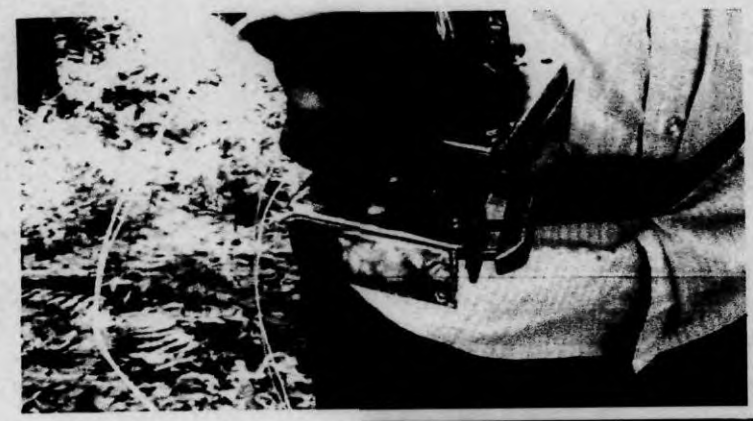


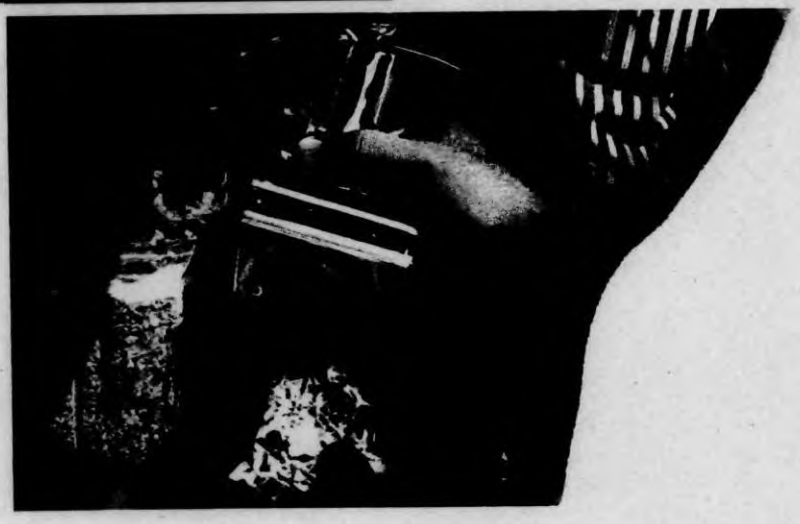
"You cannot change your future, but you can change your habits, and surely your habits will change your future."

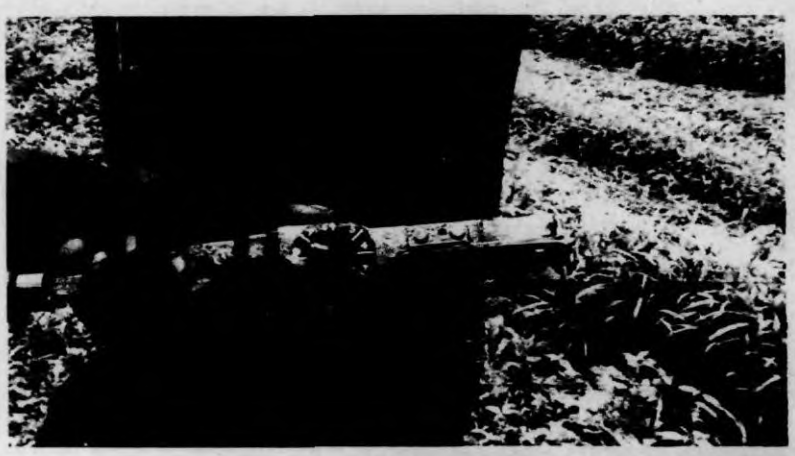
- Dr. A.P.J. Abdul Kalam

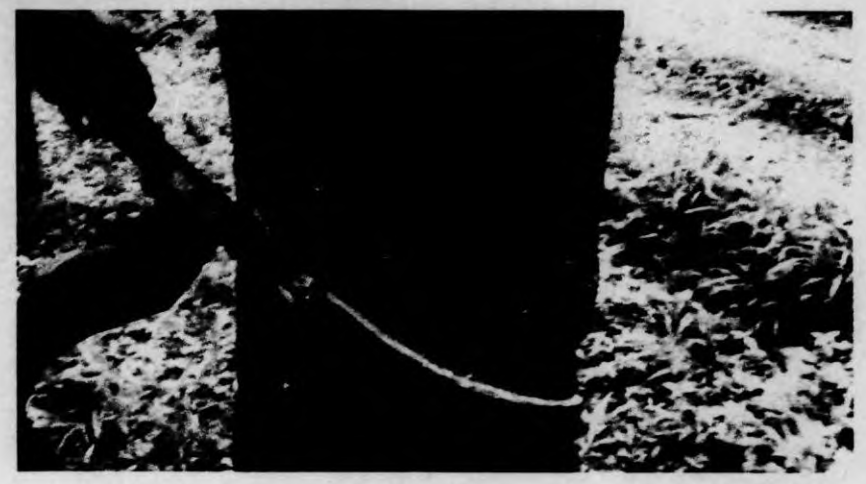
Thank you for the patient hearing

Thanks to MRB & IRRDB for giving me this opportunity









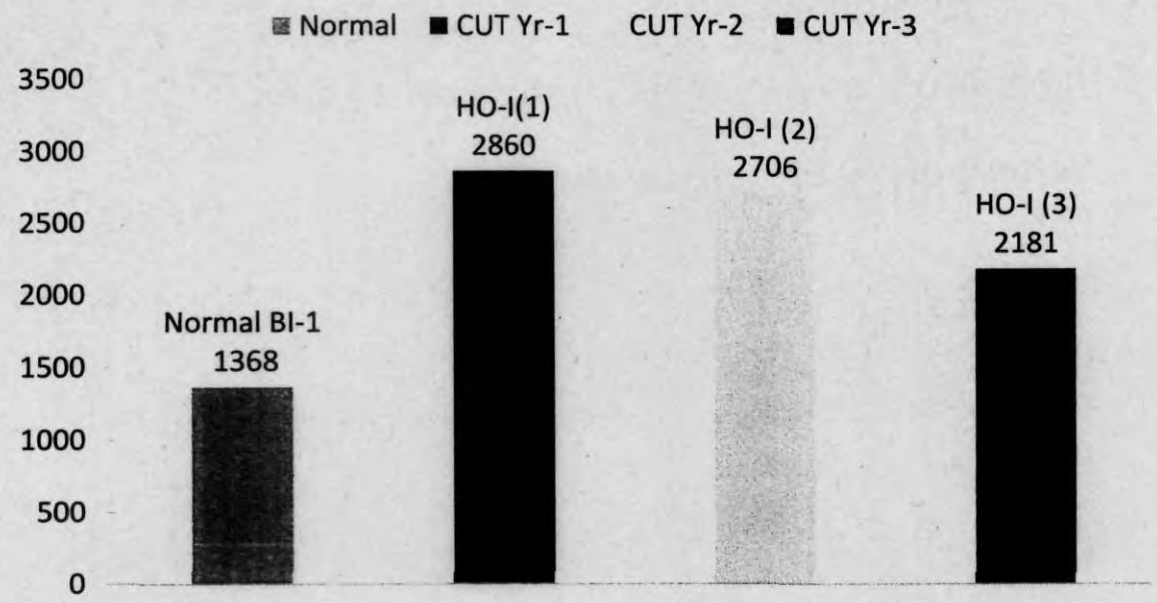
We have recommendations for low frequency CUT
During monsoon season - S/2 normal base panel
After monsoon – 6 months CUT on S/4 or S/3

- Under d3 or d4 frequency, trees can be tapped under CUT on S/4 panel
- Under weekly tapping, trees need to have S/3 panel for CUT
- Yield stimulation recommendation varies depending on clone, tapping frequency and length of cut

Neria Estate

RRII – LH

Yield (Kg ha^{-1}) under CUT in comparison to normal basal panel



Short term and long term strategies

Adopt scientific tapping for better yield and long life of trees.

Adopt CUT and LFT to sustain high yield and reduce cost.

56% holdings are very old and unproductive adopt CUT to increase yield.

Replant very old areas with good quality planting materials of high yielding clones.

Use root trainer plants to save cost.

Adopt zero pitting to save cost and prevent loss of top soils.

Take excellent care during immaturity period:

Timely fertilizers, plant protection, weeding, shading.

Plant inter crops (avoid root competition).

Adopt apiary in mature areas.

Avoid weeding in mature area to save cost and help improve soil health.

No one plant rubber for charity

↑Profit = ↑Productivity, ↓Cost, ↑Price

Productivity is the only factor on which grower can have almost full control. To some extent, on cost of production also. Price is fully out of grower's control

Yield performance under weekly tapping (d7) with stimulation

	Maneesh Jose, Erattupetta			RRII 105	430 trees	Taps
Month	Latex	FC	Dry wt L	Dry wt FC	Total	
July	268	13.5	107.2	8.1	115.3	4
August	593	35	237.2	21	258.2	5
Sept	583	37.5	233.2	22.5	255.7	4
October	659	56	276.8	33.6	310.4	4
November	973	86	408.7	51.6	460.3	5
December	638	53	268	31.8	299.8	4
Total (6 m)	3714	281	1531.1	168.6	1699.7	26
Kg/tap			58.9	6.5	65.4	
kg/tree	4.0			drc%	41.2	

Regular tapping result in good yield

Long term yield performance (Kg ha^{-1}) under S/2 d3 and S/2 d4 frequency tapping in clone RRII 105

Year	S/2 d3	S/2 d4	Year	S/2 d3	S/2 d4
96-97	1769	1732	04-05	2457	2217
97-98	1704	1720	05-06	2647	2306
98-99	1659	1889	06-07	1982	2130
99-00	2062	2172	07-08	1904	2007
00-01	1541	1555	08-09	2213#	1908
01-02	2114	2057	09-10	2155	1898
02-03	2834*	2147	Mean	2126	2012
03-04	2729	2440*	TPD%	5.7	6.1

* BO-2 panel-1st yr # BI-1 panel – 1st yr

Dry rubber yield (Kg ha^{-1}) of RRII 105 (mean of 5 blocks) under weekly tapping(8 year)- D.Karnataka

Year	Yield	Kg tap^{-1}	Kg $tree^{-1}$
2003-04	1503	28.9	3.76
2004-05	2066	39.7	5.17
2005-06	1869	35.9	4.67
2006-07	2133	41.1	5.33
2007-08	2032	39.1	5.08
2008-09	1880	36.2	4.70
2009-10	1604	32.1	4.01
2010-11	2134	42.7	5.36
Mean	1903	37.0	4.76

Annual Bark Consumption – 14cm TPD : < 5 % Stimulation during 2003 & 2004 – Fortnight; Monthly from 2005