Identification of promising clones of *Hevea* for commercial cultivation in Tripura

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Introduction



- The state of Tripura of North East India (22°56'-24°32'N and 91°10'-92°21'E) represents non-traditional region for rubber cultivation
- Tripura has a sub-tropical warm perhumid climate with a conspicuous winter season and strong wind
  - Limits the growth and yield of rubber
- Crucial to identify the promising clones adapted to this region

Objective

- Clone trials were conducted from 1979 onwards at Regional Research Station, Agartala, for evaluation of potential clones for their adaptability in this region
- Identification of the potential clones for commercial cultivation in Tripura, on the basis of their performance in different evaluation trials conducted so far

Materials and Methods

- Thirty two oriental clones Large Scale trials (LST) and on-farm trials (OFT) in Tripura.

Sl. No	Year of planting	No. of clones	Clones	Design	Duration of yield data collection
1	LST 1979	15	RRII 5, RRII 105, RRII 118, RRII 203, RRIM 600, RRIM 605, RRIM 703, PB 5/51, PB 86, PB 235, RRIC 52, RRIC 105, GT 1, Gl 1 and Harbel1	CRD with 40 trees/clone	14 years
2	LST 1987	12	RRII 105, RRII 118, RRII 208, RRIM 600, PB 5/51, PB 86, SCATC 88/13, SCATC 93/114, Haiken 1, PR 107, GT 1 and Gl 1	CRD with 50 trees/clone	Seven years from 1999

Sl. No	Year of planting	No. of clones	Clones	Design	Duration of yield data collection
3	LST 1995	10	RRII 105, RRIM 600, RRIM 612, PB 217, PB 260, PB 235, PB 311, SCATC 88/13, SCATC 93/114 and Haiken 1	RBD with 3 replications , 25 trees /plot with wind belt.	7 years
4	LST 1996	13	RRII 51, RRII 105, RRII 176, RRII 203, RRII 414, RRII 417, RRII 422, RRII 429, RRII 430, RRIC 100, RRIM 600, PB 217 and PB 235	RBD with three replications, 36 trees/plot (16 net trees)	9 years

On Farm Trials

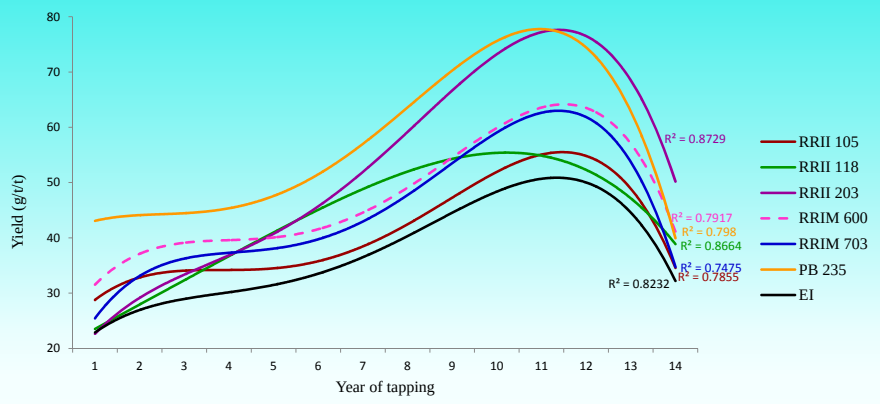
Sl. No	Year of planting	No. of clones	Clones	Design	Duration of yield data collection
5	OFT 1997 Killamura	6	RRII 203, RRII 208, RRIM 600, PB 235, PB 260 and Haiken 1	Blocks with minimum 100 trees/block	5 years
6	OFT 2000 Bagafa	8	RRII 118, RRII 203, RRII 208, RRIM 600, RRIM 703, PB 235, PB 260 and Haiken 1	Blocks with minimum 100 trees/block	2 years
7	OFT 2005 Pathalia	7	RRII 105, RRII 414, RRII 417, RRII 422, RRII 429, RRII 430, RRIM 600	Blocks with minimum 200 trees/block	Immature
8	OFT 2009 Hirapur	9	RRII 203, RRII 208, RRII 417, RRII 422, RRII 429, RRII 430, PB 235, PB 260, RRIM 600	Blocks with minimum 150 trees/block	Immature

Results and Discussion

LST 1979

- PB 235 recorded highest yield followed by RRII 203 and were superior to check clone RRIM 600
- Clones RRII 105, RRII 118 and RRIM 703 also gave mean yield higher than the grand mean (37.2g/t/t).

Clone	Mean yield (g/t/t)
PB 235	56.97
RRII 203	52.27
RRIM 600	47.31
RRIM 703	44.72
RRII 118	43.59
RRII 105	40.97
RRII 5	35.26
GT 1	34.80
PB 86	34.25
RRIC 105	34.17
RRIM 605	33.31
RRIC 52	31.51
PB 5/51	27.49
Harbel 1	23.65
GI 1	18.13



Trial	Potential clones identified
LST 1979	PB 235, RRII 203 RRIM 600, RRIM 703 RRII 105, RRII 118

LST 1987

- Clone RRII 208 gave the highest mean yield and was superior to check clone RRIM 600
- Clones RRII 105, RRII 118 and PB 5/51 also recorded higher mean yield than the grand mean of the trial (31g/t/t).

Clone	Mean yield (g/t/t)
RRII 208	43.69
RRIM 600	37.66
PB 5/51	33.90
RRII 105	32.77
RRII 118	32.06
SCATC 88/13	30.23
PB 86	29.80
GI 1	27.83
Haiken 1	27.19
GT 1	26.21
SCATC 93/114	25.87
PR 107	22.76

- High winter girth increment as well as percentage tappability and low wind damage of SCATC 93/114 was reported earlier
- Buffering capacity of RRII 208 to seasonal variations was also reported earlier

Trial	Potential clones identified
LST 1987	RRII 208, RRIM 600 PB 5/51, RRII 105, RRII 118

LST 1995

- Clone PB 311 gave the highest yield
- Clones RRII 105 (48.1g/t/t) and SCATC 93/114 (46.13g/t/t) also gave yield higher than check clone RRIM 600 (44.34 g/t/t).

Clone	Mean yield over 7 years (g/t/t)
PB 311	48.93
RRII 105	48.07
SCATC 93/114	46.13
RRIM 600	44.34
PB 235	43.17
PB 260	41.43
SCATC 88/13	41.14
PB 217	40.49
RRIM 612	32.37
Haiken 1	28.21
CD (0.05)	7.41

- Better growth performance of PB 311 was reported earlier.
- PB 235 and PB 260 also gave yield higher than grand mean of the trial (41.4g/t/t) and were on par with RRIM 600

Trial	Potential clones identified
LST 1995	PB 311, RRII 105, SCATC 93/114 RRIM 600, PB 235, PB 260

LST 1996

- Clone RRII 422 (48.45g/t/t) recorded the highest yield among the clones evaluated
- Clones RRII 429, RRII 417 and RRII 430 recorded better yield than check clone RRIM 600 (41.30 g/t/t)

Clone	Mean yield over nine years (g/t/t)
RRII 422	48.45
RRII 429	46.26
RRII 417	42.58
RRII 430	41.35
RRIM 600	41.30
RRII 105	38.99
RRIC 100	37.92
PB 235	36.44
RRII 414	34.04
RRII203	32.95
RRII 176	32.57
PB 217	30.88
RRII 51	28.83
CD (0.05)	4.67

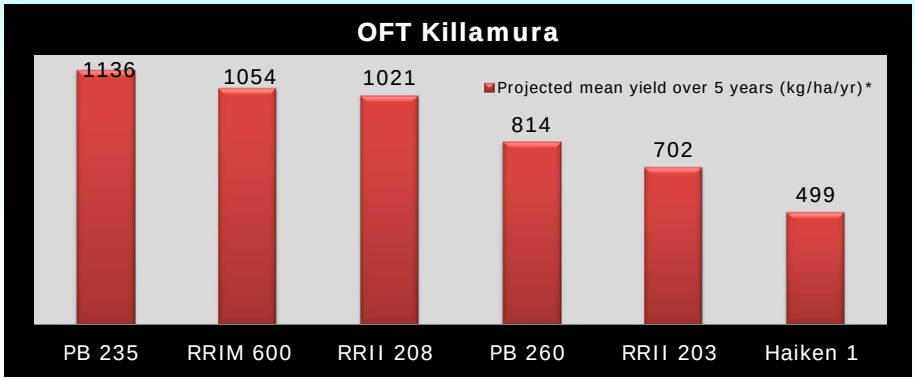
- Clone RRII 429 was reported to have high girth and girth increment in the immature phase

Trial	Potential clones identified
LST 1996	RRII 422, RRII 429 RRII 417, RRII 430, RRIM 600 RRII 105, RRIC 100, PB 235



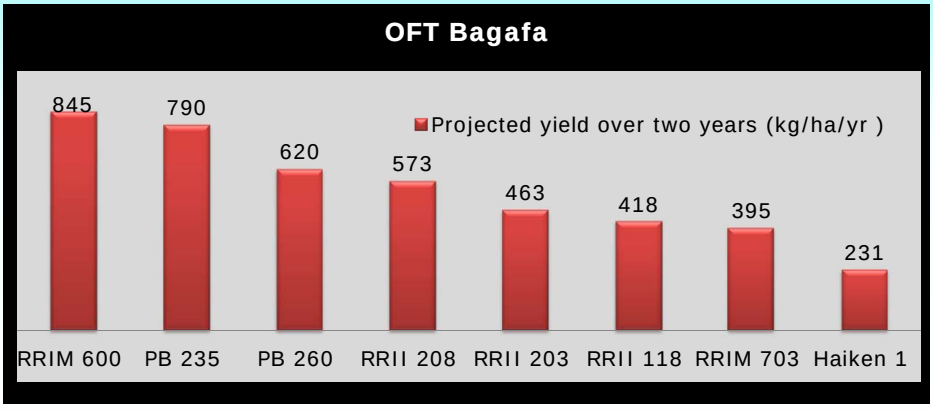
On Farm Trials

- In the OFT at Killamura, PB 235 had the highest yield (1136 kg/ha/yr) followed by RRIM 600 (1054 kg/ha/yr) and RRII 208 (1021kg/ha/yr).



*Assuming 400 trees/ha and 130 tapping days/year.

- Yield in the first two years of tapping from OFT at Bagafa showed that RRIM 600 was the highest yielder followed by PB 235
- PB 260 and RRII 208 also gave higher yield than grand mean (542 kg/ha/yr)



*Assuming 400 trees/ha and 101 tapping days/year.

- Immature trials at Hirapur and Pathalia, revealed the cold susceptibility of RRII 422 and high vigour of RRII 429
- Based on the survey of existing commercial plantations Sasikumar *et al*. (2005) reported that RRIM 600 (1212 kg/ha/yr) was the highest yielder followed by RRII 105 (1058 kg/ha/yr).



Conclusions

- RRIM 600, PB 235, RRII 208 and RRII 105 consistently gave high yield in all the trials
- RRII 203, SCATC 93/114, PB 311, RRII 422, RRII 429, RRII 417 and RRII 430 gave higher yield than RRIM 600 at least in one LST, indicating their high yield potential.
- RRII 118, SCATC 88/13, PB 217, RRIM 703 and PB 260, gave higher mean yield than the grand mean (36.7g/t/t) at least in one LST.

Trial	Potential clones identified
LST 1979	PB 235, RRII 203 RRIM 600, RRIM 703 RRII 105, RRII 118
LST 1987	RRII 208, RRIM 600 PB 5/51, RRII 105, RRII 118
LST 1995	PB 311, RRII 105, SCATC 93/114 RRIM 600, PB 235, PB 260
LST 1996	RRII 422, RRII 429 RRII 417, RRII 430, RRIM 600 RRII 105, RRIC 100, PB 235
OFT 1997	PB 235, RRIM 600, RRII 208 PB 260
OFT 2000	RRIM 600, PB 235 PB 260, RRII 208

- Based on the yield performance, RRIM 600, RRII 208, PB 235, PB 260 and RRII 105 can be considered suitable for commercial planting in Tripura.
- Yield performance of clones in the four on-going OFT's will aid in validation of yield performance of the clones facilitating the up-gradation of more clones to category I and II for commercial cultivation in this region.


Thank you