1. Introduction

- Rubber is one of the main agricultural resources.
- Rubber clone diversification in Cambodia is the main topic of the rubber development to answer the need of planters.
- Agricultural Productivity Improvement Project (APIP) was financed by World Bank.
- The SRRC/APIP involved a research activity on 4 agronomical test:

  - clone comparison tests
  - fertilizer tests
  - planting tests
  - intercropping tests

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2. Objectives

1. Identification of the geographical areas (soils and climate) and the clones that are likely

2. Production of the technical data needed to confirm Cambodia's suitability for Smallholder Rubber Development.

3. Sustainable good rubber yield for smallholders.

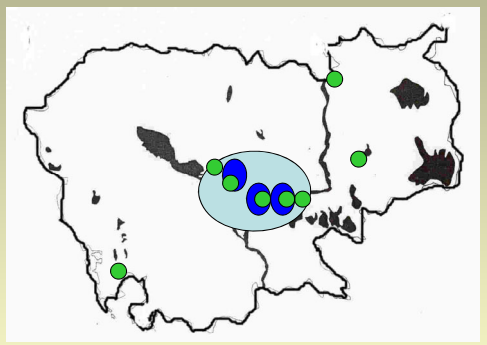
Table of SRRC'Trials

Location	Type of trials				Total
	Clone	Fertilization	Inter-crop	Planting Material	
- Chamcar Andong	4	4			8
- Kompong Som	1	1		1	3
- Kompong Thom	2	2	1	1	6
- Memot	4	3		1	8
- Mondolkiri	1	2		1	4
- Rattanakiri	4	3	3		10
- Snuol	4	3	1	2	10
- Trapaeng Russey	2	2			4
Total	**22**	**20**	**5**	**6**	**53**

SRRC trials planted from 1998 to 2002

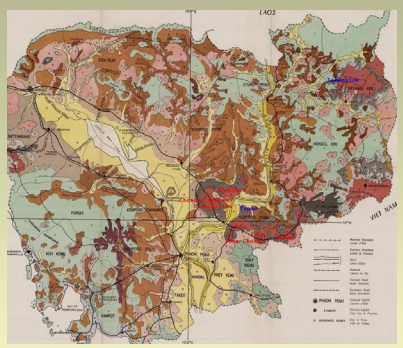
Trials	Planting year					Total
	1998	1999	2000	2001	2002	
Clone	4	2	6	8	2	22
Fertilizer	4	1	5	7	3	20
Intercropping				3	2	5
Planting materials			4	2		6
Total	**8**	**3**	**15**	**20**	**7**	**53**

Map of the SRRC' Trials



APIP, SRRC 1998 - 2005

PHF AFD, 1999 – 2005



Soil map in Cambodia

3. Research methodology on clonal test

-Four clones are compared according to their characteristics of growth and production

-Clones: GT1, RRIM600, IRCA18, PB260

-Experimental sites:
Chamcar Andong, Trapaeng Russey, Snuol, Memot, Kompong Thom, Ratanakiri

-Experimental design:

- planting pattern 6 x 3m
- 5 lines per clone
- 160 plants per clone
- Trial dimension: 20 rows x 32 plants = 640 pl
- Surface: 1.15 ha

4. Preliminary result of clonal tests

Table1. Girth 5 years after planting

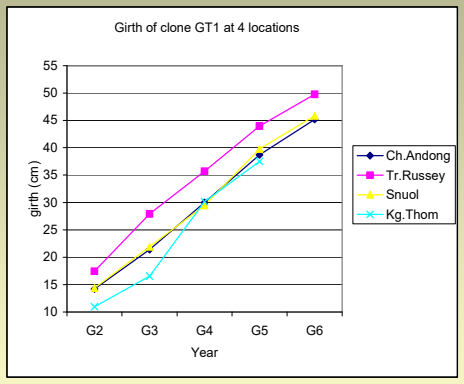
Clones	Locations	Mean	F_{Value}	(P)
GT1	Kg.Thom	37.52[d]	190.1	0.001
	Snuol	42.34[b]		
	Ch.Andong	39.40[c]		
	Tr.Russey	43.97 [a]		
Note: a>b>c>d>e, P<0.001				
Clones	Locations	Mean	F_{Value}	(P)
PB 260	Kg.Thom	36.99[c]	265.3	0.001
	Snuol	40.91[b]		
	Ch.Andong	41.74[b]		
	Tr.Russey	43.79 [a]		
Note: a>b>c>d, P<0.001				

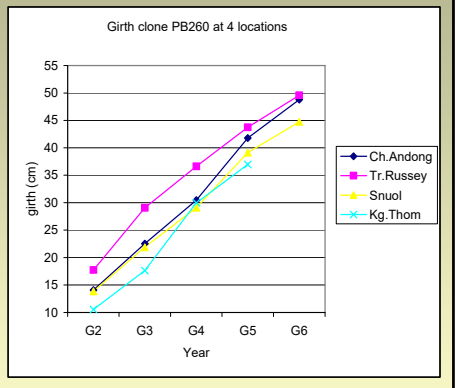
4. Preliminary result of clonal tests (cont)

Clones	Locations	Mean	F_{Value}	(P)
IRCA 18	Kg.Thom	38.56[c]	294.8	0.001
	Snuol	41.81[b]		
	Ch.Andong	44.40 [a]		
	Tr.Russey	45.16 [a]		
Note: a>b>c>d, P<0.001				

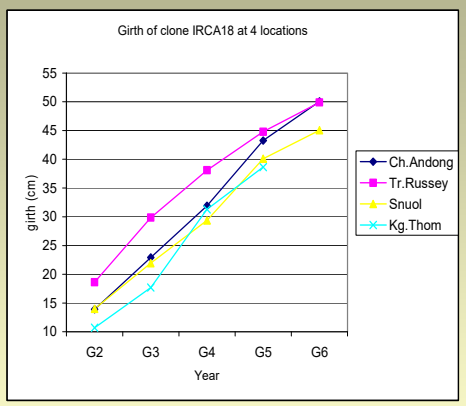
Clones	Locations	Mean	F_{Value}	(P)
RRIM 600	Kg.Thom	38.07 [c]	170.3	0.001
	Snuol	39.99[b]		
	Ch.Andong	38.82[bc]		
	Tr.Russey	43.58 [a]		
Note: a>b>c>d, P<0.001				

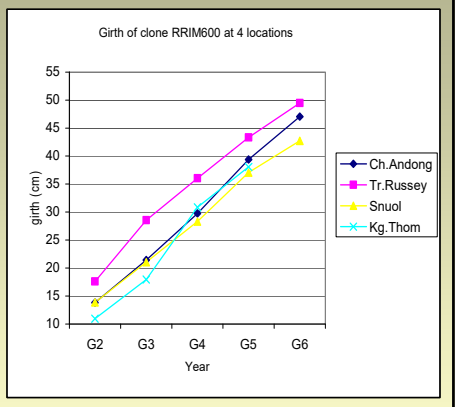
4. Preliminary result of clonal tests (cont)



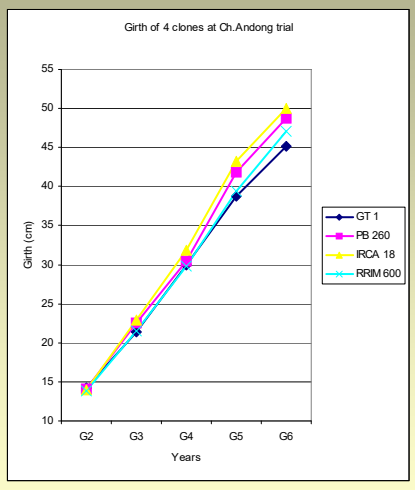


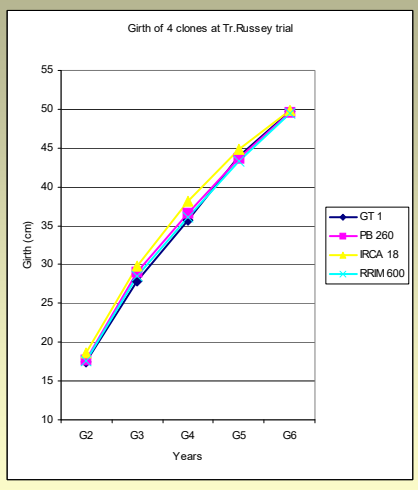
4. Preliminary result of clonal tests (cont)



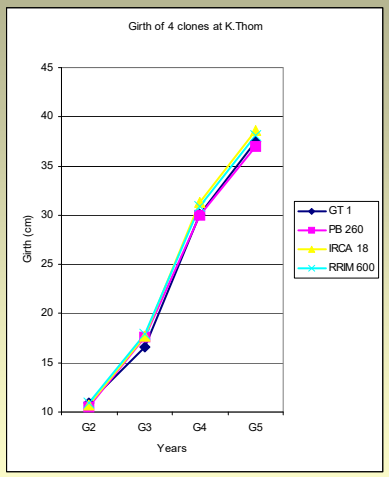


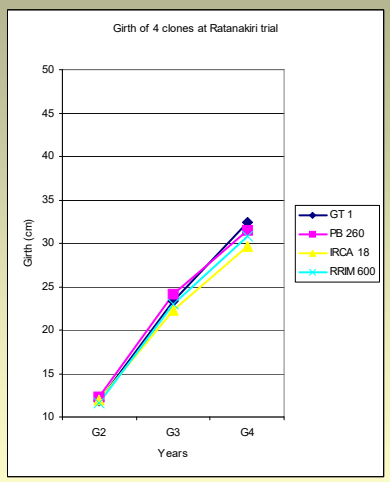
4. Preliminary result of clonal tests (cont)



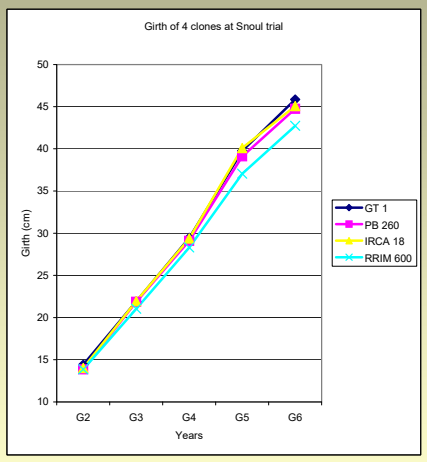


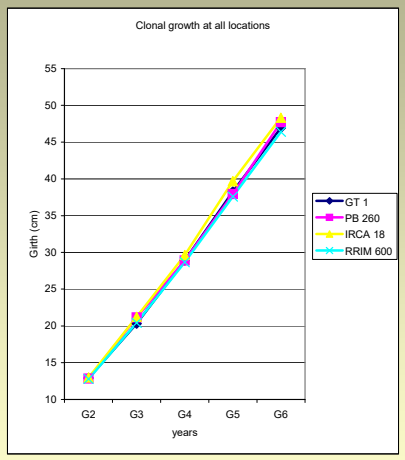
4. Preliminary result of clonal tests (cont)





4. Preliminary result of clonal tests (cont)





4. Preliminary result of clonal tests (cont)

Girth increment one year after openning at clonal test

Trials	Years	Girth increment(cm) per clone			
	2006-2007	GT1	PB260	IRCA18	RRIM600
CATC01		4.10	3.84	4.62	4.15
CATC02		3.76	2.79	3.02	4.28
TRTC01		2.92	2.37	2.36	2.27
TRTC02		3.49	2.57	2.48	2.86

4. Preliminary result of clonal tests (cont)

Average annual yield kg/ha for 2 years of tapping

Year		GT1	IRCA18	PB260	RRIM600
1	2004	294 100%	469 160%	528 180%	350 119%
2	2005	665 100%	1039 156%	1111 167%	953 143%

Average production g/t for 2 years of tapping

Year		GT1	IRCA18	PB260	RRIM600
1	2004	915 100%	1510 165%	1405 154%	1285 140%
2	2005	1575 100%	2520 160%	2310 147%	2315 147%

5. Research methodology on fertilizer test

- Each trial compares 3 increasing levels of fertilizer
-Two clones are compared according to their characteristics of growth and production
- Planting materials (Clones: GT1, RRIM600)
-Treatment: Half dose, Standard dose, Double dose
-Experimental sites:
Chamcar Andong, Trapaeng Russey, Snuol, Memot, Kompong Thom, Ratanakiri
-Experimental design:
  - planting pattern 6 x 3m
  - 5 lines per clone
  - 160 plants per clone
  - Trial dimension: 15 rows x 32 plants = 480 pl
  - Surface: 0.90 ha

6. Preliminary result of fertilizer tests

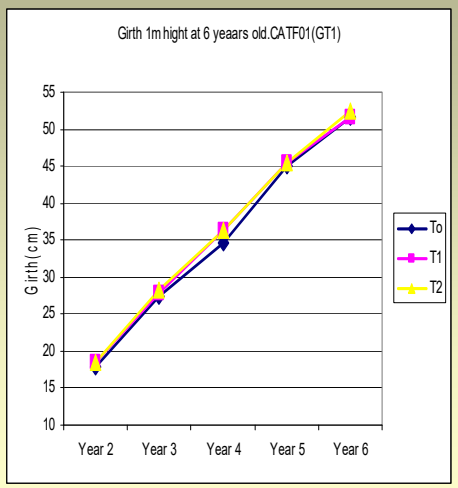
Girth 6 years after planting for clone GT1

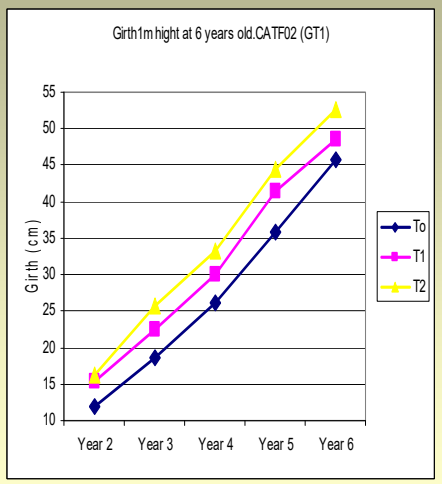
Treatment	T0	T1	T2
Girth (cm)	48.66	50.08	52.54
Index	97%	100%	105%

Girth 6 years after planting for clone RRIM600

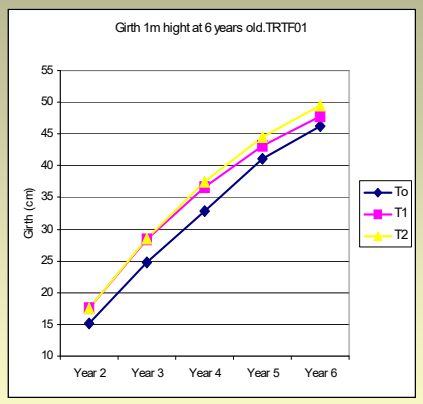
Treatment	T0	T1	T2
Girth (cm)	47.46	48.36	49.78
Index	98%	100%	103%

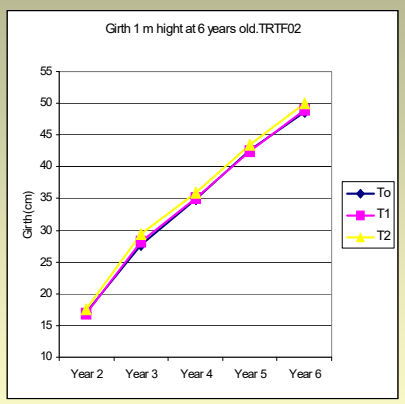
6. Preliminary result of fertilizer tests (cont)





6. Preliminary result of fertilizer tests (cont)





6. Preliminary result of fertilizer tests (cont)

Annual yield kg/ha for 2 years of tapping

Year		Clones	To	T1	T2
1	2004	GT1	507	635	698
			79%	100%	109%
		RRIM600	342	404	482
			84%	100%	119%
2	2005	RRIM600	814	919	942
			88%	100%	102%

Yield g/t/t for 2 years of tapping

Year		Clones	To	T1	T2
1	2004	GT1	22.15	23.86	28.14
			93%	100%	118%
		RRIM600	16.10	15.43	18.84
			104%	100%	122%
2	2005	RRIM600	23.67	21.21	22.52
			111%	100%	106%

7. Conclusion

-Regarding all clones girth after 5 years trial, faster growing was observed in Trapeang Russey than in other locations

- Girth of clone IRCA18 is the best at all locations, after 5 years trial

- Average of clones girth increment is 6-10 cm every year in immature period

- Fertilizer did affected the girth of the trees during immature period

- Actually, the cumulated Kg/ha were higher for treatments with fertilizer.


Thank for you attention