REPORT ON THE MISSION TO THAILAND 31ST MARCH TO 16TH APRIL 1989

M. DE LA SERVE

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REPORT ON THE MISSION TO THAILAND
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This mission was undertaken jointly with Professor CONDOMINAS from 1st to 16th April.

We should like to thank Mr. ROUDEIX for his hospitality in Bangkok

and

Messrs. J. IVANOFF and P. LE ROUX for their hospitality at PATTANI.

1. PURPOSE OF THE MISSION

This mission was intended to support the operation:

"Improvement of *Hevea* production and, in particular, exploitation systems"

conducted in South Thailand since May 1988. Most of this mission was undertaken jointly with Professor CONDOMINAS, who had come to assist Mr. J. IVANOFF and Mr. P. LE ROUX, both ethnologists working on the project.

2. MISSION SCHEDULE

Friday 31st March:	Departure from Paris.
Saturday 1st April:	Arrival in Bangkok, meeting with Mr. ROUDEIX.
Sunday 2nd April:	Mission preparation. Meeting with Dr. SUSHIVA (MAHIDOL University). Kind invitation to dinner from Mr. PELLAUMAIL, Cultural and Scientific and Technical Cooperation Counsellor.
Monday 3rd April:	Accompanied by Prof. CONDOMINAS and Mr. ROUDEIX: Morning Meeting at ORRAF with: - Mr. NARONG SUCHARE, Managing Director - Mrs. CHAMNOON THITATARN, Assistant Director - Mr. NARONG SOOKPREDEE, Planning and Monitoring Center. Afternoon Meeting at DOAE with Mr. SERI, Chief of Para Rubber Group (Crop Promotion Division).
Tuesday 4th April:	Morning Visit to EEC with Mr. ROUDEIX, at Mr. BAILLY's request.

Afternoon

Meeting with Dr. CHOOMPOL SWASDIYAKORN, Secretary General of the National Research Council, along with Prof. CONDOMINAS and Mr. ROUDEIX.

Meeting with his Excellency, Mr. BASTOUILLE, French Ambassador, along with Prof. CONDOMINAS and Mr. PELLAUMAIL.

Wednesday 5th April: Departure for HAT YAI, met by Dr. NOPARAT.

Lunch with Dr. SANIT SAMORSON, RRL Director and Mr. SOMSAK PUKPIBOON, Director of the SU-NGAI PADEE Station.

Arrival by road at PATTANI.

Thursday 6th April: Visit to SAI BUBI village.

Friday 7th April: Morning

Meeting with:

- Mr. PAN YAUNLEE, PSU Vice Rector.
- Staff from the Faculty of Human Sciences.
- Dr. BOONTHAM and Mrs. NITHI UTHAI, Faculty of Science and Technology.

Afternoon

Work session with the Data Processing Centre.

Saturday 8th April: Visit to LU BO PAN YANG village (KABANG District).

Sunday 9th April: Visit to AI YAWEN and THANTO villages.

Monday 10th April: Morning

Work meeting with Prof. CONDOMINAS, Jacques IVANOFF and Pierre LE ROUX.

Afternoon

Summing up with Dr. BOONTHAM, Dr. NOPARAT and Mrs. NITHI UTHAI.

Tuesday 11th April: Visit to SU-NGAI PADEE Station, accompanied by Dr. BOONTHAM and Mrs. NITHI UTHAI.

Wednesday 12th April: Morning

Meeting with Data Processing Centre staff.
Departure for HAT YAI, along with
Dr. NOPARAT.

Afternoon

Met by Igor BESSON.

Meeting with:

- Head of RRC Economic Group
- Dr. WEERAPANT MUSIGASARN, Dean of the Faculty of Engineering.

Thursday 13th April: Morning

Meeting with Dr. CHOKCHAI ANAKATCHAI

Afternoon

Meeting with Dr. SANIT SAMORSON
Mr. SOM SAT

Kind invitation to dinner from Dr. SANIT SAMORSON.

Departure for Bangkok.

Friday 14th April: Morning

Meeting with: Mr. KASEM, RRI Director
Mrs. VARAPORN
Mr. ROUDEIX

Kind invitation to lunch from Mr. KASEM.

Afternoon

Meteorological Institute
Dinner with Mr. LELARGE, Cultural Attaché.

Saturday 15th April: Work meeting with Mr. ROUDEIX.
Meteorological Institute.

Sunday 16th April: Morning

Departure for Indonesia.

3. REMINDER OF WORK OBJECTIVES

Thailand produces 950,000 tonnes of natural rubber, i.e. 19% of world production. The total area planted with *hevea* is estimated at 1.5 million hectares. Production structures are small, since 95% of them cover only 2 to 3 ha.

Plantations are distributed throughout 17 of the country's provinces, mostly in the South. Renovation of these plantations began in 1961, following the introduction of a replanting subsidy. From 1962 to 1987, 650,000 ha were replanted. Production increased from 290,000 tonnes in 1970 to 985,000 tonnes in 1988, making Thailand the world's third largest producer.

Nonetheless, while planting techniques have been well mastered by farmers, the techniques recommended for tree exploitation are not applied: farmers tap their trees too frequently - 5 to 6 days a week - eventually causing a drop in production and a reduction in the trees' economic lifespan. Hence, mean yields for clonal plantations are around 850 kg/ha, i.e. half of potential mean yields.

Farmers replant their trees after 12 to 15 years' exploitation, whereas the replanting schemes allowed for at least 25 years' exploitation.

The current *hevea* exploitation system therefore poses a problem on both micro-economic and macro-economic levels. A technical, social and economic analysis of production systems is currently under way. An investigation network involving 10 villages in 4 provinces of South Thailand has been operating since mid-1988 and provides an opportunity for studying the main exploitation parameters.

This phase should make it possible to identify the main problems faced by farmers and understand the reasons why they adopt such or such an apparently irrational practice.

Once this analysis has been completed, at the end of 1989, a work seminar will be convened for all the Research and Development partners* in the natural rubber sector, along with representatives from the villages investigated.

There will then be discussions on *Hevea* exploitation principles, based on the physiological knowledge acquired through Research and the results of the investigations made, bringing out the strategies adopted by farmers. Based on these discussions, the types of experiment to be set up will be defined, along with the methods to be used for setting up and monitoring Research conducted with farmers.

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* Office for Rubber Replanting Aid Fund (ORRAF)
Department of Agriculture Extension (DOAE)
Farming Research Institute
Rubber Research Institute - HAT YAI Centre (RRI/RRC)

The proposed Research involves:

- A research phase with farmers, with parallel research on a station:

  The zone to be studied is in the South of the Thailand peninsula, along the Malayan border, and offers very variable situations for different factors:

  - relief,
  - location with respect to towns and roads,
  - Buddhist or Islamic religion,
  - rice growing,
  - tapping system, etc.

  Based on the spatial diversity of the production systems, farm operations will be typologically defined, which will make it possible to determine the different types of experiment to be proposed with a view to improving production systems. In certain cases, technical references will be available, but in others it will be necessary to set up trials with the farmers, whilst conducting parallel trials on a station.

These experiments pose design and organizational problems for their setting up, monitoring and validation. Research will concentrate on:

- Developing experimental methods on smallholdings. Of the 10 villages investigated, it should be possible to set up experiments in 4 or 5 or them and thereby test experiment set-up, monitoring and assessment methods, so that methodologies can be proposed: farmer participation, planting design, monitoring, interpretation.

- Agronomy trials: anti-*phytophthora* treatment and tapping trials. Tapping trials should be conducted over a period of 1 to 2 years, depending on the trials in question. The results of these trials will be periodically assessed by the other members of the investigation network.

  Furthermore, the transformations proposed will be subject to technical, social and economic monitoring, so as to be able to assess the methods to be applied to the acceptance or rejection of innovations, their productivity in the actual environment, their evolution and any effects they have on social stratification developments.

  The quality of the relationship built up with farmers should make it possible to set up a durable experiment.

During this experimental phase, the analysis of production systems and their evolution could be continued and improved upon.

♦ Innovation extension at regional level

Given the geographical extent of the current network, this will involve concentration of the trials, using the results obtained, based on the initial farmers involved in the experiments and the other farmers investigated.

4. MAIN LINES OF RESEARCH

4.1. Diagnosis

Based on the work already undertaken and on field visits, certain points will need to be worked on further:

♦ Ethnographical approach

- Transmission of land, relationship between farm size and tapping frequency,
- Budget: debts and prestige expenses; connection with sales and tapping frequencies,
- Strengthening of ties between rubber marketers and farmers.

♦ Agronomical and economic approach

- Analysis of production systems: 3 to 4 villages, e.g. SAI BURI, LU PO BAN YANG, BONGO, BETONG.
- Description and analysis of cropping practices on a limited sample.
- Data processing for main variables (verification and outputs; d/1 tapping production level depending on tree age).
- Reconstitution of panel history on plantations.

4.2. Experiments

A work seminar is scheduled for November 1989, to take stock of the study results and the basic knowledge acquired of exploitation physiology and experiment methodology.

This seminar will be attended by all the Research and Development partners: RRI/RRC-HAT YAI, ORRAF, DOAE, FSRI, PSU-PATTANI, IRCA and village representatives (see Annex I).

At the end of this seminar, after a field visit to PATTANI, the main trials to be set up with farmers will be decided upon: location, setting up and monitoring methods, planting design, techniques, etc.

It is certain that these experiments will be looking into *hevea* tapping frequencies, though not exclusively. Bibliographical references to daily tapping production (5 to 6 days a week) compared to other tapping systems are very limited:

In Thailand

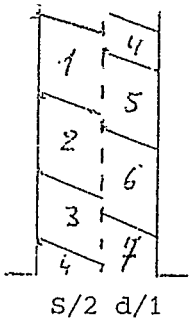
A trial set up in 1979 on RRIM 600 at RRC in HAT YAI gave the following results:

Tapping system	Year								Mean
	1	2	3	4	5	6	7	8	
1/2 S d/1	23	30	40	42	35	34	33	24	30
1/3 S d/1	20	21	32	32	35	42	30	16	28
1/2 S 3d/4	28	28	40	34	36	43	42	44	36
1/2 S 2d/3	29	39	44	36	42	52	46	47	41
1/2 S d/2	30	38	48	49	40	44	56	49	44

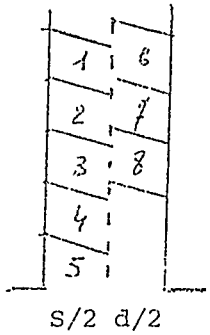
Table 1: Production results in g/tree/tapping (60 trees/system)

There was no tapping on Sundays; tapping was prevented on 51 days, on average, by rain, and there were 10 public holidays. Thus the mean number of tapping days for d/2 comes to 120 and 231 for d/1.

After 8 years' exploitation, the percentage of dry cuts reaches 26% for tapping system d/1 and 3% for tapping system d/2:



S/2 d/1



S/2 d/2

Production in g/tree/tapping does not appear to be sufficiently high for system S/2 d/2 in the early years for farmers to find it attractive, compared to the system currently practised.

In Indonesia

A trial was set up at SEMBAWA, but only lasted a year; it was dealt with in a paper by Dr. SULTONI at the last IRRDB meetings.

In Malaysia

A certain number of trials were conducted at the beginning of the 1970s, with the introduction of stimulation.

These trials are interesting for this work, since they dealt with smallholder problems:

(a) Tapping systems for East Coast Rubber,
Yahaya Hashim *et al.*
in Proceedings of RRIM Planters' Conference 1983.
Planting material: RRIM 600 on opening.

- Mean production over 5 years with S/2 d/1 2d/3 tapping system is, in g/tree/tapping, identical to that of the S/2 d/2 system.

  This confirms the lower production in kg/ha/yr for S/2 d/2 in the early years.

- With ET stimulation at 2.5% 10/y for the first 3 years, then 6/y the following 2 years, production in kg/ha/yr for system S/3 d/2 ST is higher than for system S/2 d/1 2d/3 (110%).

- Reduction in cut length for the d/1 2d/3 tapping system leads to very clear reductions in production, which can be compensated for by stimulation.

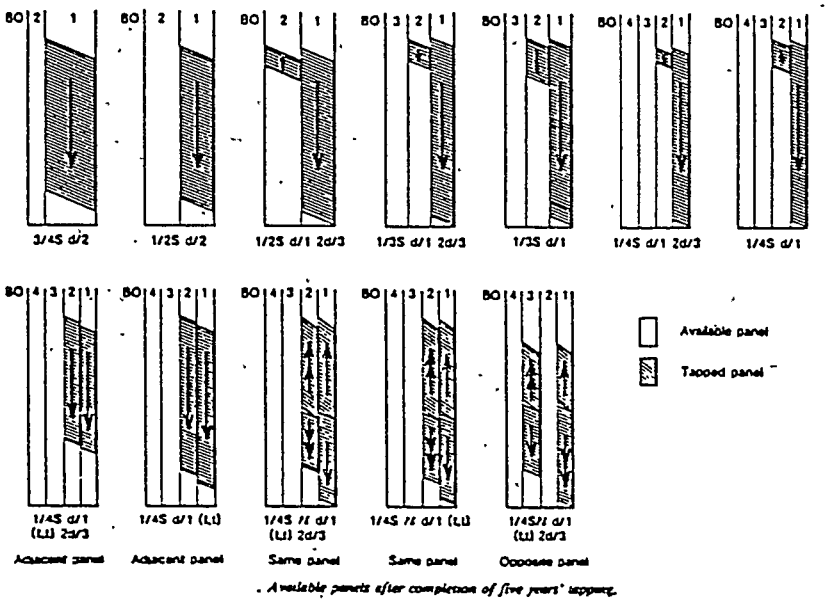
  It is therefore necessary for these tapping systems to be stimulated if they are to be adopted by farmers (see table 1).

ANNUAL YIELDS OF DIFFERENT TAPPING SYSTEMS — *EXPERIMENT TE 401.3, RRIM 600, PANELS BO-1 AND BO-2*

No.	Treatment Practical frequency 6d/7	Yield (kg/ha) 1st year	2nd year	3rd year	4th year	5th year	Cumulative	Mean over 5 years
1.	½S d/2 Control	667.5 (100)	1 106.3(100)	1 321.56(100)	1 581.58(100)	1 356.9(100)	6 038.84(100)	1 207.8
2.	½S d/2 ET	1 030.3 (154)	1 839.3(166)	1 954.52(148)	2 508.24(159)	1 830.8(135)	9 163.16(152)	1 832.6
3.	¼S d/2	970.98(145)	1 658.9(150)	1 755.41(133)	2 313.69(146)	1 824.5(134)	8 523.48(142)	1 704.7
4.	¼S d/2 ET	1 117.7 (167)	2 251.5(204)	2 471.83(187)	2 042.96(129)	1 933.9(142)	9 817.59(163)	1 963.5
5.	½S d/1 2d/3	892.4 (134)	1 802.7(163)	1 979.42(150)	1 908.40(121)	1 742.2(128)	8 325.12(138)	1 665.5
6.	½S d/1 2d/3 ET	1 203.0 (180)	2 269.5(205)	2 718.66(206)	2 505.59(158)	2 033.6(149)	10 730.35(178)	2 146.1
7.	½S d/1 2d/3	581.2 (87)	1 241.4(112)	1 417.33(107)	2 088.60(132)	1 761.3(130)	7 089.83(118)	1 418.0
8.	½S d/1 2d/3 ET	893.62(134)	1 804.7(163)	2 403.24(182)	2 005.16(127)	1 391.1(102)	8 497.82(141)	1 700.0
9.	¼S d/1 2d/3	485.4 (73)	1 218.0(110)	1 633.4 (124)	1 899.29(120)	1 620.3(119)	6 856.39(114)	1 371.3
10.	¼S d/1 2d/3 ET	799.9 (120)	1 630.6(147)	2 299.54(174)	2 446.73(155)	2 138.3(157)	9 315.07(154)	1 863.0
11.	¼S d/1 (t,t) 2d/3 AP	612.5 (92)	1 248.5(113)	1 371.01(104)	1 636.20(103)	1 608.9(118)	6 477.11(107)	1 295.4
12.	¼S d/1 (t,t) 2d/3 AP ET	1 011.97(152)	2 142.3(194)	2 503.57(189)	2 497.08(158)	2 837.9(209)	10 992.82(182)	2 198.6
13.	¼S11d/1 (t,t) 2d/3 SP	693.9 (104)	1 227.6(111)	1 317.74(100)	1 687.53(107)	1 636.2(120)	6 562.97(109)	1 312.6
14.	¼S11d/1 (t,t) 2d/3 SP.ET	1 054.9 (158)	2 139.4(193)	1 949.97(148)	2 129.83(135)	2 097.2(154)	9 371.30(155)	1 874.3
15.	¼S11d/1 (t,t) 2d/3 OP	771.4 (116)	1 366.8(124)	1 519.53(115)	2 011.88(127)	1 828.4(135)	7 498.01(124)	1 500.0
16.	¼S11d/1 (t,t) 2d/3 OP.ET	1 163.9 (174)	2 281.4(206)	2 256.28(171)	2 701.80(171)	2 359.3(174)	10 762.68(178)	2 152.5
17.	½S d/1	851.9 (128)	1 503.5(136)	1 931.04(146)	2 838.23(179)	2 449.4(180)	9 574.07(159)	1 914.8
18.	½S d/1 ET	1 347.0 (202)	1 974.1(178)	2 018.89(153)	2 249.77(142)	2 654.9(196)	10 244.66(170)	2 048.9
19.	¼S d/1	715.7 (107)	1 282.9(116)	1 630.83(123)	2 458.50(155)	2 156.0(159)	8 243.93(137)	1 648.8
20.	¼S d/1 ET	1 139.3 (171)	2 079.7(188)	2 177.7 (165)	2 391.17(151)	2 903.7(214)	10 691.57(177)	2 138.3
21.	¼S d/1 (t,t) AP	833.36(125)	1 409.0(127)	1 607.11(122)	2 356.86(149)	2 289.0(186)	8 495.33(141)	1 699.1
22.	¼S d/1 (t,t) AP.ET	1 186.8 (178)	2 188.1(198)	2 490.92(188)	2 848.36(180)	2 522.5(186)	11 236.68(186)	2 247.3
23.	¼S11d/1 (t,t) SP	891.6 (134)	1 377.0(124)	1 444.01(109)	1 901.09(120)	1 935.1(143)	7 548.80(125)	1 509.8
24.	¼S11d/1 (t,t) SP.ET	1 394.0 (209)	2 260.4(204)	2 179.31(195)	2 409.49(152)	3 250.6(239)	11 493.80(190)	2 298.8

ET = 2.5% La 0.5 (-).6/y(m)
AP = Adjacent panel
SP = Same panel
OP = Opposite panel
Assumed tappable stand per hectare was 296 trees.
Figures within brackets are percentages of ½S d/2 control.
Stimulation rest:-January to March
Experiment commenced in September 1977.
Tapping panel for all treatments on *BO-2* except Treatments 1, 2, 3, 4, 11, 12, 21 and 22 on *Panel BO-1*.

Table 1.



Available panels after completion of five years' tapping.

MEAN YIELDS FOR FIVE YEARS

Tapping cut	Mean yield (g/tree/tapping) d/2 Unstimulated	d/2 Stimulated	d/1 2d/3 Unstimulated	d/1 2d/3 Stimulated	d/1 Unstimulated	d/1 Stimulated
½S	45.9(100)	67.0(146)	46.9(102)	60.4(132)	-	-
½S	-	-	34.0(74)	48.5(106)	42.2(92)	44.3(97)
¼S	-	-	39.1(85)	50.4(110)	36.3(79)	47.1(102)
¼S (t,t) alternate panel	-	-	39.4(86)	69.2(151)	40.0(87)	53.6(117)
¼S11(t,t) same panel	-	-	40.4(88)	57.0(124)	35.3(77)	55.6(121)
¼S11(t,t) opposite panel	-	-	45.8(100)	68.5(149)	-	-
¼S	63.0(137)	72.0(157)	-	-	-	-

Figures within brackets are percentages of the control

(b) "Stimulation Procedures for Rubber Smallholders",
B. Manikan and P.D. Abraham,
in Proceedings of the RRIM Planters' Conference 1976.

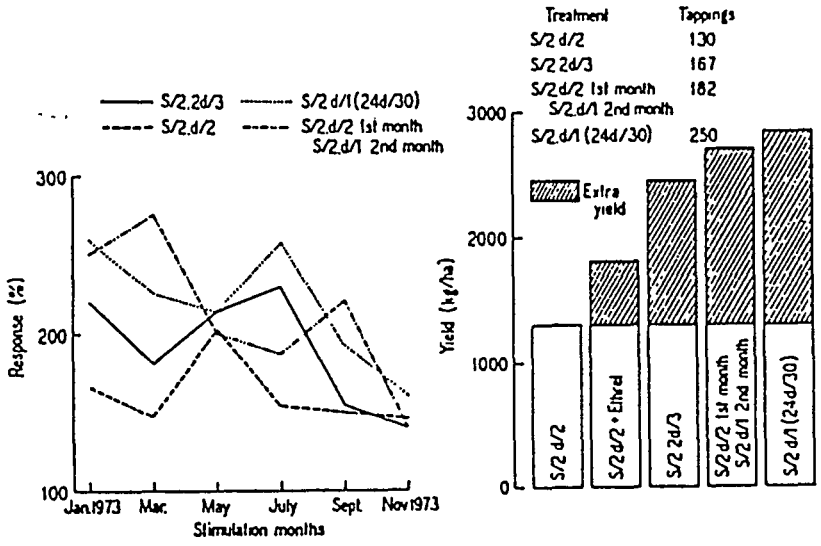
Results concerning clone PB 86 over 1 year.

Table 2

YIELD, DRY RUBBER CONTENT AND INCIDENCE OF DRYNESS WITH DAILY PERIODIC TAPPING SYSTEM AND STIMULATION

Treatment	Experiment PRE 105, PB 86					
	Unstimulated			Stimulated		
	Yield (kg/ha)	Mean d.r.c.	Incidence of dryness	Yield (kg/ha)	Mean d.r.c.	Incidence of dryness
S/2.d/2	1 311(100)	38.5	2.3	2 111(161)	34.4	3.2
S/2.d/1.2d/3	1 622(124)	39.4	3.7	2 470(188)	32.4	7.2
S/2.d/2 first month followed by d/1.15d/30 second month	1 876(143)	38.0	7.3	2 726(208)	33.1	5.1
S/2.d/1.24d/30	2 517(192)	35.1	3.9	2 835(216)	32.8	7.0

Figures within brackets indicate percentage of unstimulated S/2.d/2.
Ethephon was applied to the panel (above the cut) at bimonthly intervals.
Incidence of dryness is expressed as percentage of length of cut.



Yield trend of Ethephon stimulated daily periodic tapping systems.

Bibliographical searches should be continued, though it would appear that few results are available covering long periods. This confirms the need for experiments to be conducted with farmers, in parallel with experiments on Stations, with long-term monitoring.

CONCLUSIONS

The daily investigation system conducted over a long period in a very large geographical region has made it possible to ensure a good regional approach and to establish excellent relations with farmers. Furthermore, extension of innovations at regional level should be facilitated.

The main difficulty at the moment is slow data acquisition and processing; this should be solved with the arrival of an agricultural economist, Mr. BESSON, who will be making his contribution to the diagnosis with an economic analysis of production systems.

2ND FRANCO-THAI SEMINAR ON NATURAL RUBBER

Workshop on tapping practices on smallholdings in South Thailand

21st - 24th November 1989

RRI/ RRC - Hat Yai, PSU - Pattani, IRCA

Programme

Tuesday, 21st November

Opening by the Minister of Agriculture

Morning : 1st session : Physiology and Tapping Systems

Physiology of latex production : Dr. Sanit Samorson

Tapping practices based on physiological knowledge : Dr. Y.L. Jacob

Tapping system trial (d/2 in comparison with d/1) : ChokThai AnakaThai

Tapping system trial (d/3 ST in comparison with d/2 : Mr. de La Serve

Lunch at the RRC

Afternoon : 2nd session : Results of the survey undertaken in the southern provinces

Methodology - General aspects : M. de La Serve

- Ethnologic approach : G. Condominas
J. Ivanoff

Smallholder relations systems : P. Le Roux

Technical and economic results : X and I Besson

Motivation and reticence with respect to changes : J. Ivanoff, P. Le Roux

Wednesday, 22nd November

Morning : 3rd Session : On-farm trial methodology

On-farm trial example in the smallholder environment : Farming System Research Institute

On-farm trial methodology : Ph. Jouve

Trial proposals : I. Besson

Afternoon : free, departure for PATTANI

Thursday, 23rd November : Field work

Visit to a 1st village

Lunch and visit to a 2nd village

Friday, 24th November : 9 to 10 pm : Final meeting for those in charge

IRCA/CIRAD
MS/MM

Paris, 23rd May 1989

2nd FRANCO-THAI SEMINAR
on
NATURAL RUBBER
Workshop on Tapping Practices in Thai Smallholding in South-Thailand

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ORGANIZING COMMITTEE

- Rubber Research Institute/ Rubber Research Center HAT YAI.
- Prince of Songkla University, Campus of PATTANI.
- Mahidol University.
- Institut de Recherches sur le Caoutchouc.

EXPECTED PARTICIPATION

D.O.A.E.	1	from BANGKOK	+	4	from the	4	provinces
O.R.R.A.F.	"	"	+	"	"	"	"	"
F.R.I.	> 1							
R.R.I.	2							
R.R.C.	10							
P.S.U.	5							
E.H.E.S.S.	3							
IRCA	5							
D.S.A.	1							
I.N.R.A.	1							
Villagers	10							

FUNDING*

- R.R.C.-HAT YAI
- P.S.U.-PATTANI
- FRANCE

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*Transport to HAT YAI and accommodation are the responsibility of each participant

ANNEX II

ORRAF SHEET

- 2,200 staff, 500 of whom are at Head Office.
- 12 provincial offices and 35 Ampoe offices.
- By the end of 1987, 3.8 million raïs had been replanted (640,000 ha).
- ORRAF Budget:

  . Resources: Export taxes,
  Financial income,
  Government subsidy (loans from World Bank and CDC).

  . Outgoings: < 5% research,
  90% subsidy for replanting and ORRAF running costs.
  5% ORRAF Head Office running costs.

- ORRAF is in charge of replanting; DOAE is in charge of exploitation.

  Nonetheless, ORRAF attributions have been extended to cover initial tree tapping (from 5.5 to 7.5 years).

- Replanting Conditions:

  - plot > 2 raïs (0.3 ha)
  - low yielding plot = < 80 kg/raï
  - plot suitable for *hevea* growing
  - trees 25 years old (reduced to 20 years in practice)
  - 4,800 Baht/raï (i.e. 7,500 FFrs/ha) over 5 years, divided into subsidies in kind for plants and fertilizers and in cash for days worked (62 days/t/year at 43 Baht/day, i.e. 70% of the minimum wage).

ANNEX III

VISIT SHEET - SUNGAI PADEE STATION

- 40 ha of experiments (+ 30 ha of RRIM 600 for self-financing).
- Clonal recommendations:

- Class 1	:	RRIM 600 PR 255 PR 261
- Class 2	:	PB 235 BPM 24 GT 1 PB 260

BPM 24 would appear to be *Phytophthora* and *Oidium* resistant, but susceptible to *Colletotrichum*.

- 4 clonal trials, comprising:

Trial No. 1

KRS 21, PR 255, PR 261, RRIC 6, AVROS 2037, GT 1, set up in 1986 and opened in June 1987 (1/2 S d/2).

Production in 1st Year	kg/ha	g/tree/tapping
- PR 261	218	24.8
- PR 255	153	24.9
- RRIC 6		
- KRS 21	75	24
- GT 1	104	14.9

Trial No. 2

KRS 25, 48, 57, 133, 138, 156, 161, 163, RRIM 600, GT 1, set up in 1978, opened in June 1987: 30 trees per tapping system, clones KRS 57, 133, 161 producing 30 g/tree/tapping, as opposed to 25 for RRIM 600 and 16 for GT 1.

Germplasm Observation : 60 origins from Malaysia.

Intercropping trials : - clove/banana under *Hevea*
- latose