

EMPRESA BRASILEIRA DE PESQUISA AGROPECUARIA
CENTRO NACIONAL DE PESQUISA DE SERINGUEIRA E DENDE.



REPORT ON PRESENT STATUS OF *HEVEA* GERMOPASM IN BRAZIL
COLLECTED IN 1981 IRRDB EXPEDITION

18 JUNE, BRASILIA - BRASIL

PAULO DE SOUZA GONÇALVES

Report on present status of ...
1982
RT-FOL1857
CPAR-11103-1



MANAUS-AMAZONAS-BRASIL

1982

FOL

1857

REPORT ON PRESENT STATUS OF *Hevea* GERMPLASM IN BRAZIL

COLLECTED IN 1981 IRRDB EXPEDITION

18 JUNE - BRASILIA - BRAZIL

INTRODUCTION

The first expedition with the purpose of collecting botanical material of native rubber trees (*Hevea* spp) in Brazil was held in 1945 in the Rondonia Territory. The collected seeds were planted in 84 hectares but these were destroyed by fire in 1950. Later in 1952, a new expedition was designated to collect materials from the same trees in the same area (Moraes 1963). Ten years later, in 1962 a further expedition was carried out and a *Hevea* breeding programme based on the wild mother trees in jungle was initiated. From the results of previous expeditions, the Acre and Rondonia states have shown the presence of high yielding vigorous germplasm.

In 1974, SUDHEVEA carried out with IRCA an expedition in Acre and Rondonia for collecting budwood. Those budwoods were sent to Belem. Later these materials were multiplied and sent to a quarantine station in Guadeloupe. So, in 1978, 41 clones were introduced in the Ivory Coast.

In 1978, IRRDB decided to organise a series of expeditions to cover the whole Amazon basin. Thus the first phase of the joint IRRDB/Brazil expedition was carried out successfully from January to March 1981. The main objective of this mission was to collect seeds, budwood and seedlings of *Hevea* spp from Acre, Rondonia and Mato Grosso areas. A total of 64.723 seeds and about 1.522 meters of budwood were collected.

All the seeds and budwood collected were sent to the National Rubber and Oil Palm Research Centre (CNPSP) in Manaus. The seeds were examined for presence of pathogens and viability and divided into two equal portions: 50% were planted in CNPSP. From the 32 thousands seeds, 23.235 seedlings

have been obtained. These seedlings were raised in nursery in the distance of 1.0 x 1.0 meter and were released for establishment in the field since February 1982.

In addition to the seedlings, budwood of 194 mother trees have been multiplied in the primary nursery in Manaus.

This report presents, details of the grafted germplasm at CNPSD, as to inform the situation of this material and the availability of the material for dispatching to the Intermediate Quarantine Nursery in Guadaloupe.

I - BACKGROUND OF THE MOTHER TREE BUDWOOD COLLECTION

a) Selection

In the pre-selection of trees in the field, the basic objective was to identify the best yielding phenotypes for further yield recording and observation. The findings from the preliminary investigations have been used in the process.

b) Method for collecting

For the pre-selection of the wild mother trees, the tappers were contacted for location of the high yielding trees giving more than 1000cc of latex per tapping. This information was confirmed. Absence from *Microcyclus ulei* and *Phytophthora* sp leaf fall symptoms was checked visually. Budwood from orthotropic branches were then collected and the cut end waxed and stored in moist saw-dust and sent for grafting at the CNPSD's nursery in Manaus.

c) Mother tree collecting data

Yield, number of panels, circumference at 1,5m of height and

degree of disease incidence were recorded for each selected tree. Bark samples were taken for laboratory analyses. The bark samples were taken at precisely 1.5m above the soil surface.

d) Bark characteristics measurements

The following bark characteristics were measured:

1. Bark thickness
2. Total number of latex vessel rings was determined by examining the radial longitudinal sections of the bark.
3. Diameter of latex vessels was observed in the transverse section of the bark.
4. Density of latex vessels per 5 mm of ring was determined taking into account the average per all rings.
5. Average distance between consecutive latex vessel rings was determined based on all rings.

The results of these measurements can be followed in Table 1.

II- CURRENT STATUS OF THE MOTHER TREES BUDWOOD

A total of 194 mother trees budwood collected was originated from Rondonia (118) Mato Grosso (49) and Acre (27). Budwood of all mother trees were multiplied in the primary nursery at CNPSD experimental field. Among these total only 155 had been survived in budwood nursery. At the present the material are distributed as follows:

	<u>Clones with budwood</u>	<u>Clones with dormant budstumps</u>	Total
Rondonia	86	05	91
Mato Grosso	43	00	43
Acre	21	02	23
Total	150	07	157

The possible cause of the insucces of same clones were the quality of the budwood collected, no peeling etc.

Budwood of each survived genotype was supposed to be released to Guadeloupe on February 1982 and additional shipment of budwood to Guadeloupe was planned for April of the same year. Nevertheless, the slow growth of some clones and the high incidence of *Thanatephorus cucumeris* which was difficult to control because the heavy rain on the period of January - March retarded releasing of the material for September of October of the current year.

a) Desease Control

The grafted nursery has been sprayed twice a week with fungicide, against *Microcyclus ulei* and *Thanatephorus cucumeris*. Therefore, the frequent rains washed off the leaves, making it difficult to control the *T. cucumeris*. Depending on the weather conditions, the new leaf whorls was completely defoliated.

The incidence of *T. cucumeris* as well as the severity of the infection of the desease is strongly influenced by the prevailing climatic condition.

b) Variation of the clones in the nursery

Great inter and intraclonal variability has been observed among the different materials, mainly growth. It is possible that the main factor is related to soil, as we know, some soils of Rondonia and Acre have high fertility and high pH. The soils of Manaus have low fertility and low pH. Similar performance of materials selected in both states in 1974, 1978 and 1979 prospections have been observed in Manaus. Emphasis should be done to the trees selected in Costa Marques in Rondonia where it is suppose to be a overlapping area of two species of *Hevea*. Probably *H. brasiliensis* x *H. guianensis* hybrids. General aspect concerning grafting and growth of the clones can be followed on Table 2.

III - CURRENT STATUS OF SEEDLINGS MATERIAL COLLECTED IN 1981 PROSPECTION

1. NURSERY STAGE

The viability of the seeds planted in Manaus had raised about 20.000 seedlings in the nursery originated from 61 different provenances (Table 3).

The nursery was located at the experimental field of the Rubber Research Centre (CNPSD). The seeds were germinated at seedbed and planted at the nursery. The spacing used was 1.0 x 1.0 meter and was remained in the nursery for a period of 12 months.

a) Girth measurements

On February 1982, a total of 20 thousand seedlings were girth measured in the nursery at the height of 20cm from the ground. All the data was recorded on the CNPSD computer for future needs.

b) General disease observation

For growth development, fungicide against *Microcyclus ulei* and *Tanathephorus cucumeris* was sprayed. Nevertheless the fungicide was not effective against *T. cucumeris* during the most critical rain season (January - March). *M. ulei* was not severe, during the nursery period.

2. FIELD

The seed collected in the 1981 prospection were established as Provenance blocks and Provenance trial. The seedlings were cut back and transplanted in the field as mini-stumps on April 1982.

Provenance blocks

The size of the blocks varied according to the number of the seedlings for each different provenance. The field planting was carried out at a spacing of 4.0 x 4.0 meters and comprehended an area of 10 hectares.

Provenance Trial

In addition to the blocks, a experiment designed as 6 x 6 triple lattice, 50 trees per plot, spaced 4 x 4m was established. The experiment titled "Study of genetic variation among different provenance of *Hevea brasiliensis* is 9 ha big and has the following objectives:

- To identify genetic differences concerned to primary and secondary characters associated to the provenances.
- To identify the magnitude of the geographic variation estimated by the difference among provenance.
- To select the best individuals among the better provenances.
- To investigate the variability in relation to the incidence of diseases including the most susceptible among the different provenances.

Evaluation

During the first phase (seedling nursery) only diameter and height growth were recorded. All these data were recorded at CNPSD computer for the future needs.

During the second phase (adult seedlings) after tree years, numerous characters will be documented following the descriptors manual that include besides primary and secondary characters, other characters.

IV - ESTIMATES FOR THE ESTABLISHMENT AND MAINTENANCE OF THE PRIMARY NURSERY

	Cr\$
Fiel personnel services	1.300.000,00
Weedkeelers	225.000,00
Pesticides	191.000,00
Fertilizers	130.000,00
Fuel	100.000,00
Tools	94.000,00
T O T A L	2.040.000,00

At present rate fo exchange, 1 US\$ - Cr\$ 190,00

TABLE 1 - Circunference (CC), bark thickness (EC), total number of latex vessel rings (NA), diameter of latex vessel (DV), density of latex vessels per 5mm per ring (DVL) and average distance between consecutive latex vessel rings (DMCAV) of selected mother trees from Acre State. Na
naus, AM - CNPSD. 1982.

Mother tree	CC (m)	EC (mm)	NA	DV (μ m)	DVL	DMCAV (μ m)
AC/I/01	3.14	0.94	30	21.35	1721	268.40
02	2.20	0.96	31	24.40	1844	275.48
03	0.95	0.68	19	24.40	1090	211.89
04	0.95	0.69	20	25.93	1147	244.00
05	3.60	0.74	17	18.30	1114	179.41
06	1.54	0.81	11	18.30	631	335.50
07	1.85	0.85	28	21.35	1607	257.07
08	0.53	0.51	15	17.20	861	211.46
09	2.00	0.82	22	28.06	1442	260.63
10	0.80	-	-	-	-	-
11	1.20	0.79	21	24.40	1204	290.47
12	3.35	0.96	20	25.62	1147	277.55
13	2.10	0.72	19	29.28	1245	317.84
14	1.84	0.80	19	25.62	1245	321.05
15	3.95	1.03	22	24.40	1442	349.36
16	0.98	0.87	19	23.18	1168	269.68
17	3.10	0.76	20	25.62	1311	353.80
18	2.10	0.76	16	24.40	918	221.13
19	1.66	0.72	13	21.96	852	206.46
20	1.74	0.70	14	25.62	860	122.00
21	0.73	0.51	8	24.40	524	320.25
22	2.48	1.01	24	23.18	1377	355.83
23	1.53	1.07	25	21.96	1639	283.04
24	1.12	0.92	26	25.62	1918	159.53
25	1.86	0.68	13	24.40	1131	262.79
26	2.22	1.08	25	20.74	1844	244.00
27	0.86	0.56	17	19.52	905	208.11
MT/I/01	1.60	11.5	35	30.5	2008	250.97
02	2.20	14.8	31	36.6	1524	432.90
03	1.70	16.8	40	27.4	1967	396.50
04	2.05	19.6	65	33.5	3196	272.59
05	1.50	12.8	32	30.5	1836	343.12
06	1.45	10.7	28	27.4	2065	270.14
07	1.75	13.2	30	33.5	1721	386.33
08	1.45	7.7	20	24.4	1147	244.00
09	1.65	19.3	27	27.4	1549	478.90
10	1.06	8.8	26	27.4	1704	309.69
11	1.69	15.4	34	24.4	1672	332.29
12	1.58	20.2	38	27.4	2180	417.36
13	2.10	23.4	58	33.5	2852	361.79
14	1.24	13.4	41	36.6	2352	219.60
15	2.85	25.6	45	27.4	2950	517.82

Mother tree	CC (m)	EC (mm)	NA	DV (μm)	DVL	DMCAV (μm)
16	2.52	19.6	44	30.5	2524	388.18
17	3.80	32.7	59	30.5	3385	427.00
18	2.40	17.2	40	30.5	1967	366.00
19	2.44	17.5	30	30.5	1721	475.80
20	2.43	19.0	32	33.5	2098	503.25
21	1.14	9.2	35	21.3	1434	200.00
22	1.87	16.7	40	36.6	2295	311.10
23	2.02	13.1	34	36.6	1950	261.94
24	0.95	9.5	29	24.4	1901	210.37
25	1.38	16.6	43	39.7	2819	134.20
26	1.37	17.3	37	33.5	2122	339.62
27	0.93	8.5	28	24.4	1606	261.42
28	2.08	15.6	30	36.6	1475	406.66
29	0.70	6.5	7	18.3	459	418.28
30	2.07	9.2	17	18.3	836	215.29
31	1.53	22.9	35	33.5	1721	460.11
32	1.51	18.3	36	33.5	2065	407.67
33	0.60	6.9	22	24.4	1262	221.81
34	0.86	7.2	17	21.3	975	272.70
35	2.00	19.7	45	33.5	2950	287.37
36	1.81	15.4	37	30.5	2295	296.75
37	0.84	10.0	10	24.4	573	414.80
38	1.45	14.0	20	27.4	1311	488.00
39	1.55	14.8	22	27.4	1352	449.18
40	1.30	11.5	20	36.6	983	305.00
41	1.63	14.6	28	36.6	1370	261.42
42	0.73	9.1	16	24.4	1049	358.37
43	1.92	17.2	34	33.5	1950	356.10
44	1.71	14.9	22	30.5	1172	593.36
45	0.69	7.3	5	24.4	327	1.024.80
46	1.43	12.0	15	33.5	860	504.26
RO/I/001	1.30	1.20	42	30.57	2410	273.04
002	2.20	0.90	20	26.43	1147	256.20
003	1.90	2.02	42	32.53	2410	313.71
004	1.50	0.93	37	24.40	2426	194.54
005	1.60	0.78	19	24.40	1090	287.05
006	1.46	1.49	34	21.35	2229	349.85
007	2.00	1.46	37	24.40	2122	276.53
008	2.10	1.32	39	26.43	2237	308.12
009	2.23	1.67	55	28.46	3155	270.61
010	1.98	0.91	15	24.40	983	378.20
011	3.38	1.06	35	29.48	2008	278.85
012	2.30	1.27	50	24.40	2868	254.98
013	2.10	0.80	17	26.43	975	387.52
014	2.10	1.43	40	26.43	2622	335.50
015	2.50	1.01	21	24.40	1032	406.66
016	3.70	1.44	30	28.46	1721	474.92
017	2.10	1.87	43	24.40	2467	374.51
018	2.85	0.89	19	30.50	1245	308.21
019	2.20	1.20	30	24.40	1721	321.26
020	1.80	1.19	41	24.40	2688	229.12
021	2.30	1.75	50	20.33	3278	244.00

Mother tree	CC (m)	EC (mm)	NA	DV (μm)	DVL	DMCAV (μm)
022	1.56	1.35	42	26.43	2409	305.00
023	2.00	1.29	12	21.35	1262	427.00
024	2.90	1.49	38	24.40	2180	288.94
025	2.85	1.33	28	26.43	1606	322.42
026	2.60	1.27	32	24.40	1836	343.12
027	2.64	1.15	32	24.40	1573	228.75
028	2.10	1.25	43	28.46	2467	258.18
029	2.15	0.81	28	24.40	1606	226.57
030	2.60	0.78	21	26.43	1204	255.61
031	1.18	0.99	20	24.40	1147	250.10
032	1.10	0.95	37	24.40	2426	164.86
033	2.10	1.42	30	28.46	1727	199.26
034	2.55	0.76	14	26.43	918	296.28
035	2.38	0.91	21	32.53	1549	264.33
036	2.60	0.94	21	18.30	1032	235.28
037	2.20	1.28	32	26.43	1836	305.00
038	1.70	0.95	20	24.40	983	274.50
039	3.30	0.92	30	22.36	1721	217.56
040	1.50	0.81	12	22.36	1180	298.22
041	1.70	0.79	36	24.40	1770	155.88
042	1.60	0.87	31	26.43	1778	204.64
043	1.90	1.38	28	24.40	1606	261.42
044	2.40	6.80	23	26.43	1319	190.95
045	3.00	1.01	27	28.46	1770	314.03
046	2.60	1.00	48	24.40	3147	133.43
047	0.55	0.46	17	18.30	975	179.41
048	1.40	0.80	34	24.40	1950	190.17
049	1.55	1.31	28	24.40	1606	296.28
050	0.90	0.95	18	18.30	1239	386.33
051	0.90	1.20	41	26.43	2352	244.00
052	1.10	1.22	41	24.40	2016	214.24
053	0.95	0.57	12	28.46	786	264.33
054	1.30	1.44	23	18.30	1319	323.56
055	1.70	1.16	39	26.43	2237	234.61
056	1.50	1.17	31	26.43	1778	318.77
057	1.15	1.49	33	24.40	1622	358.60
058	1.70	1.47	34	24.40	1672	384.76
059	2.10	1.75	40	26.43	2295	330.68
060	1.70	1.34	30	24.40	1475	361.93
061	1.60	1.23	25	24.40	1434	373.32
062	1.65	1.20	25	26.43	1536	380.64
063	1.00	1.00	20	24.40	1147	265.35
064	1.00	1.50	30	24.40	1475	324.06
065	1.00	0.93	21	22.36	1204	244.00
066	1.50	1.11	22	20.33	1262	349.36
067	1.55	1.35	41	22.36	2352	273.75
068	0.85	1.44	14	24.40	803	339.85
069	1.05	0.94	28	28.46	1836	252.71
070	2.00	1.03	19	24.40	1090	378.84
071	1.80	0.81	26	22.36	1491	262.76
072	-	1.87	37	24.40	2426	318.04

Mother tree	CC (m)	EC (mm)	NA	DV (μm)	DVL	DMCAV (μm)
073	1.80	1.97	46	24.40	2639	322.70
074	1.30	1.03	28	24.40	1836	296.28
075	2.00	0.92	33	24.40	1893	221.81
076	1.30	1.03	26	24.40	1491	255.73
077	1.20	0.89	29	20.33	1901	273.44
078	2.60	1.56	27	32.53	1327	427.00
079	1.60	1.31	38	28.46	2180	288.94
080	1.50	1.25	38	24.40	2491	250.42
081	1.10	0.93	23	22.36	1131	253.38
082	1.40	1.30	45	20.33	2581	200.62
083	1.50	1.46	46	24.40	2639	294.83
084	1.75	1.20	30	24.40	1721	280.60
085	2.25	1.68	40	22.36	2295	359.90
086	1.60	1.17	39	18.30	2557	262.76
087	2.20	1.45	25	24.40	1639	517.22
088	1.75	1.52	50	22.36	2868	263.52
089	2.10	1.19	30	24.40	1844	284.66
090	2.60	0.66	15	26.43	860	357.86
091	1.70	0.80	26	18.30	1491	225.33
092	1.70	1.10	31	28.46	2032	287.29
093	1.40	0.89	30	24.40	1475	256.20
094	1.70	1.40	44	22.36	2524	244.00
095	1.30	1.14	30	28.53	1598	329.40
096	1.00	0.87	35	24.40	1721	205.65
097	1.20	1.24	29	33.50	1901	370.20
098	1.10	1.08	22	24.40	1442	271.20
099	1.50	0.82	25	22.36	1229	244.00
100	1.40	1.83	39	26.43	2557	424.34
101	2.90	1.51	42	36.60	3098	290.47
102	1.90	1.52	28	24.40	1606	470.57
103	1.70	1.41	29	22.36	1901	344.96
104	1.10	0.83	16	18.30	918	427.00
105	1.20	1.24	50	24.40	2868	206.18
106	1.10	1.44	38	24.40	2803	330.68
107	3.00	1.05	21	28.30	1204	348.57
108	1.50	1.30	26	18.30	1491	366.00
109	1.70	1.00	21	18.30	1204	273.04
110	1.00	1.08	30	22.36	1967	235.86
111	2.40	1.26	33	24.40	1893	273.57
112	2.40	1.00	20	24.40	1147	311.10
113	3.90	0.96	18	32.53	1032	393.11
114	1.30	1.33	31	18.30	2032	334.51
115	1.60	1.05	14	24.40	803	566.42
116	2.00	0.97	26	24.40	1491	429.90
117	1.10	0.84	25	18.30	1639	248.88
118	1.30	0.97	20	22.36	1311	274.50

TABLE 2 - General aspect of the grafted plants with budwood collected from native trees on the 1981 prospection. Manaus, AM - CNPSD 1982.

Clone	Metres of budwood collected	N. of budded plants	N. of. budstumps (1st observation)	N. of budstumps (w/budwood)	Growth 1 mean (m)
AC/I/ 1	08	02	02	02	1.25
2	04	08	07	03	0.96
3	06	33	32	28	1.09
4	04	05	05	03	1.23
5	06	04	04	04	1.56
6	07	07	06	06	0.99
7	07	01	01	-	-
8	04	06	06	02	0.52
9	06	10	10	05	1.22
10	05	19	13	11	1.20
11	06	03	03	02 *	-
12	04	02	02	-	-
13	09	11	09	02	0.62
14	07	07	5	03	1.17
15	08	06	05	02 *	-
16	05	05	03	01	0.64
17	03	23	20	16	1.46
18	13	13	10	07	1.92
19	09	10	07	06	1.10
20	08	07	05	01	0.41
21	07	02	01	-	-
22	11	09	09	07	1.32
23	07	20	16	03	0.74
24	09	25	19	08	1.36
25	07	04	02	-	-
26	07	09	08	07	1.04
27	07	11	14	07	1.24
MT/I/ 1	7	15	5	05	0.94
2	9	11	10	07	0.78
3	13	21	17	16	1.14
4	13	3	2	02	0.70
5	11	15	13	03	1.00
6	12	2	2	02	0.77
7	11	15	15	15	1.06
8	12	3	3	02	0.35
9	11	4	3	03	0.91
10	8	7	5	05	0.73
11	8	9	8	-	-
12	13	8	8	08	1.14
13	10	0	0	-	-
14	11	6	4	02	1.26
15	16	0	0	-	-

C l o n e	Metres of budwood collected	N. of budded plants	N. of. budstumps (1 st observation)	N. of budstumps (w/budwood)	Growth 1 mean (m)
MT/1/ 16	12	5	5	04	0.80
17	11	5	5	01	1.05
18	9	3	2	02	1.84
19	8	5	5	04	0.63
20	9	0	0	-	-
21	6	13	13	09	1.65
22	12	5	4	02	1.36
23	10	3	1	01	1.00
24	9	10	4	04	0.88
25	8	17	16	14	1.40
26	10	4	4	04	1.28
27	9	12	2	01	0.96
28	10	22	20	06	1.07
29	8	1	1	01	1.01
30	8	3	3	02	1.00
31	6	12	10	10	1.39
32	7	27	22	20	0.79
33	7	7	6	06	0.89
34	8	7	6	06	0.80
35	8	0	0	-	-
36	10	5	5	05	0.78
37/A	10	65	53	37	1.91
38/A	8	8	7	05	1.20
39/A	9	20	12	07	1.15
37/B	8	1	1	01	1.05
38/B	3	2	2	01	1.02
39/B	2	1	1	01	1.60
40	11	18	16	11	1.87
41	8	23	21	20	2.39
42	12	5	5	05	0.82
43	10	2	1	-	-
44	9	22	16	10	1.21
45	8	50	48	40	2.24
46	9	4	4	02	1.30
RO/1/ 1	12	10	07	06	0.86
2	06	07	06	04	0.76
3	07	05	03	02	0.60
4	10	28	25	23	1.54
5	14	07	06	05	1.04
6	14	20	14	11	0.96
7	10	07	06	01	1.67
8	09	10	09	05	1.11
9	07	01	01	01	0.88
10	07	06	03	03	0.55
11	06	05	04	03	1.01
12	10	-	-	-	-
13	10	02	02	01	1.28
14	13	-	-	-	-
15	09	-	-	-	-
16	10	03	-	-	-

C l o n e	Metres of budwood collected	N. of budded plants	N. of. budstumps (1st observation)	N. of budstumps (w/budwood)	Growth 1 mean (m)
RO/1/ 17	13	14	10	08	1.16
18	12	03	01	01	1.08
19	10	-	-	-	-
20	16	07	07	01	1.44
21	12	02	02	01	1.85
22	10	02	02	-	-
23	09	-	-	-	-
24	09	08	08	04	0.89
25	09	04	04	08	1.08
26	16	02	-	-	-
27	12	01	-	-	-
28	09	-	-	-	-
29	12	04	03	03	1.20
30	09	09	07	04	0.85
31	09	02	02	01	1.82
32	10	10	06	04	0.79
33	09	05	05	01	0.82
34	09	04	01	01 *	-
35	12	33	28	28	1.52
36	10	02	02	01 *	-
37	12	06	06	06	1.10
38	07	-	-	-	-
39	11	09	03	02	0.64
40	08	08	06	03 *	-
41	05	18	08	06	1.48
42	09	03	03	02	1.55
43	08	07	05	02	1.41
44	07	05	05	04	1.27
45	07	-	-	-	-
46	07	04	03	-	-
47	07	03	03	03	1.85
48	08	10	10	10	1.35
49	10	08	05	03	1.71
50	08	06	05	05	0.89
51	10	06	04	02	2.40
52	12	03	03	03	1.65
53	11	03	01	(01)	-
54	09	09	07	07	1.04
55	12	16	06	02	1.95
56	08	14	08	05	0.87
57	09	09	06	03	0.92
58	11	05	05	05	1.15
59	13	03	-	-	-
60	11	05	05	05	1.35
61	08	03	02	02	2.26
62	08	04	01	-	-
63	11	06	06	04	0.89
64	10	03	01	01	0.30
65	11	70	65	60	1.62

C l o n e	Metres of budwood collected	N. of budded plants	N. of. budstumps (1 st observation)	N. of budstumps (w/budwood)	Growth 1 mean (m)
RO/1/ 66	12	68	38	25	1.38
67	09	08	06	04	1.30
68	04	09	06	06	1.15
69	08	10	08	07	1.32
70	06	05	03	03	1.43
71	08	46	41	33	2.95
72	08	06	03	01	3.10
73	09	03	03	02	0.42
74	09	01	01	01	0.80
75	05	09	02	02	1.60
76	12	06	04	-	-
77	09	14	07	05	1.25
78	14	07	03	01	0.24
79	11	06	02	02*	-
80	09	03	03	01*	-
81	08	09	05	02	2.10
82	10	-	-	-	-
83	05	-	-	-	-
84	06	-	-	-	-
85	07	02	02	02	1.07
86	04	01	-	-	-
87	04	-	-	-	-
88	04	08	-	-	-
89	12	02	01	01	0.86
90	10	25	15	06	0.72
91	12	03	02	01	1.90
92	10	06	02	01	0.65
93	10	01	01	-	-
94	10	07	02	01	1.80
95	14	06	01	-	-
96	10	16	14	10	0.80
97	10	13	07	04	1.50
98	10	17	16	11	1.25
99	07	03	01	-	-
100	06	07	07	02	1.60
101	08	11	08	05	4.89
102	08	05	05	03	1.91
103	09	07	07	04	0.80
104	09	03	03	01	1.49
105	09	05	03	02	3.11
106	08	10	06	04	1.17
107	06	04	03	-	-
108	08	40	32	18	1.30
109	06	15	12	06	1.13
110	08	19	17	16	1.10
111	08	12	10	10	1.09
112	09	05	04	01	1.70
113	08	15	08	06	0.90
114	05	09	05	01	1.04
115	06	13	04	04	0.82
116	06	16	05	05	1.02
117	07	13	08	03	0.80
118	07	25	22	15	1.44

1 Survey made on June 1982

* Dormant budstumps.

TABLE 3 - Details on number of seeds, percentual of germination and number of seedlings of different provenances in Acre, Rondonia and Mato Grosso.

ACRE				RONDONIA				MATO GROSSO			
Provenance	Nº of seeds	% of germination	Nº of seedlings	Provenance	Nº of seeds	% of germination	Nº of seedlings	Provenance	Nº of seeds	% of germination	Nº of seedlings
AC/T/01	355	90.1	320	RO/PB/01	371	73.8	274	MT/C/01	185	92.4	171
AC/T/02	140	90.0	126	RO/PB/02	1007	83.4	840	MT/C/02	290	93.8	272
AC/T/03	106	86.8	92	RO/JP/03	932	82.7	771	MT/C/03	71	98.6	70
AC/T/04	326	79.4	259	RO/OP/04	679	61.6	418	MT/C/04	282	90.1	254
AC/F/05	679	88.4	600	RO/ J/05	246	61.0	150	MT/C/05	239	97.0	235
AC/F/06A	839	84.7	711	RO/ J/06	210	71.4	150	MT/C/06	230	94.8	223
AC/F/06B	391	82.6	323	RO/ A/07	1162	68.6	797	MT/C/07	96	91.7	88
AC/F/07	576	94.8	546	RO/ C/08	805	73.4	591	MT/C/08	82	50.0	41
AC/S/08	1549	68.8	1066	RO/ C/09	728	77.6	565	MT/C/09	55	96.4	53
AC/S/09	585	66.8	391	RO/CM/10	1519	71.4	1084	MT/C/10	228	64.0	152
AC/S/10	887	71.9	638	RO/CM/11	1046	66.2	692	MT/C/11	154	89.6	140
AC/S/11	1090	63.1	688	RO/CM/12	307	67.1	206	MT/IT/12	194	83.5	160
AC/S/12	1330	55.5	738	-	-	-	-	MT/IT/13	192	88.5	165
AC/S/13	392	38.26	150	-	-	-	-	MT/IT/14	251	90.0	226
AC/B/14	264	15.91	42	-	-	-	-	MT/IT/15	298	89.3	260
AC/AB/15	3767	22.8	860	-	-	-	-	MT/IT/16	385	84.9	319
AC/B/16	247	8.1	20	-	-	-	-	MT/IT/17	176	83.5	146
AC/B/17	400	33.5	134	-	-	-	-	MT/IT/18	180	90.5	166
AC/B/18	1739	58.0	1008	-	-	-	-	MT/ A/19	75	54.7	41
AC/B/19	1500	95.1	1427	-	-	-	-	MT/ A/20	34	44.1	15
AC/X/20	996	29.9	298	-	-	-	-	MT/ A/21	210	63.3	133
AC/X/21	631	52.4	331	-	-	-	-	MT/ A/22	47	72.3	34
AC/X/22	39	5.1	2	-	-	-	-	MT/ A/23	135	60.7	82
-	-	-	-	-	-	-	-	MT/ A/24	191	27.2	52
-	-	-	-	-	-	-	-	MT/BB/25	13	38.5	5
-	-	-	-	-	-	-	-	MT/VB/25	154	81.8	126
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
Total				Total				Total			
18.828				9.012				4.443			
60.08				71.52				77.3			
10770				6.538				3.379			