

PN-ABC-880

6/1/88

AGENCY FOR INTERNATIONAL DEVELOPMENT

WASHINGTON, D.C. 20523

DATE:

10/20/88

MEMORANDUM

TO: AID/PPC/CDIE/DI, room 209 SA-18
FROM: AID/SCI, Victoria Ose *VO*
SUBJECT: Transmittal of AID/SCI Progress Report(s)

Attached for permanent retention/proper disposition is the following:

AID/SCI Progress Report No. 2d PR

C7-021

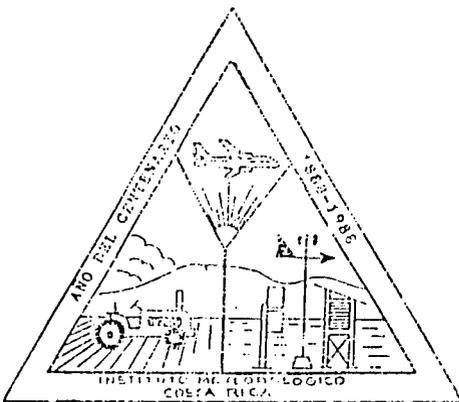
Attachment

U.S. - ISRAEL CDR PROGRAM AGENCY
FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C., U.S.A.

C 7 - 021

Rec'd in SCI: OCT 17 1988

**YIELD IMPROVEMENT OF UPLAND
RICE THROUGH MORE EFFICIENT
UTILIZATION OF RAINFALL
IN COSTA RICA**



**SECOND PROGRESS REPORT
MARCH 1988 - AUGUST 1988
GRANT No. DPE-5544-G-SS-7026-00/01**

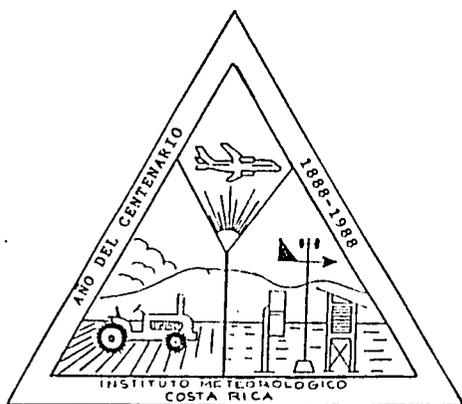
 **TAHAL
CONSULTING
ENGINEERS
LTD**

September 1988

R-88-41

U.S. – ISRAEL CDR PROGRAM AGENCY
FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C., U.S.A.

YIELD IMPROVEMENT OF UPLAND
RICE THROUGH MORE EFFICIENT
UTILIZATION OF RAINFALL
IN COSTA RICA



SECOND PROGRESS REPORT
MARCH 1988 – AUGUST 1988
GRANT No. DPE-5544-G-SS-7026-00/01

 **TAHAL**
CONSULTING
ENGINEERS
LTD

September 1988
R-88-41



22nd September, 1988

Mr. B. Rock
Scientific Attache
U.S. Embassy
Tel Aviv

Dear Sir,

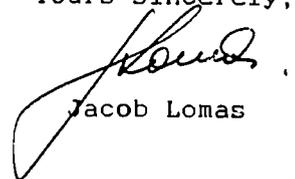
**Subject: Grant No. DPE-5544-G-SS 7026-00/01
First Progress Report March 1988-August 1988**

Please find enclosed one copy of the above Progress Report. Two additional copies have been sent to U.S.-Israel CDR Program Agency for International Development, Washington D.C.

This project has now been operational for one year. During this period, rainfall intensity data were analysed, equipment was purchased and set up in Costa Rica, and installation was in progress at all experimental sites. For the following year (1988/89) we are planning to commence with the field experiments, as planned.

My next site visit to Costa Rica is scheduled for January-February, 1989.

Yours sincerely,



Jacob Lomas

U.S. - ISRAEL CDR PROGRAM AGENCY
FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. U.S.A

YIELD IMPROVEMENT OF UPLAND RICE THROUGH
MORE EFFICIENT UTILIZATION OF RAINFALL
IN COSTA RICA

SECOND PROGRESS REPORT
MARCH 1988 - AUGUST 1988
GRANT NO DPE - 5544 - G - SS - 7026 - 00/01

TAHAL CONSULTING ENGINEERS LTD.
AUGUST, 1988

EXECUTIVE SUMMARY

The project continued into the second six months period March to August 1988. During this period the following basic activities were carried out:

1. The analysis of the rainfall data was completed.
2. The runoff batteries were constructed, delivered to the sites and installation commenced. The recording rainfall stations ordered and arrived in Costa Rica.
3. Reallocation of the experimental site was necessary at Santa Cruz in view of the exceptionally high ground water table.
4. The principal investigator was in Costa Rica from July 22 to August 23, including a weeks stopover at the National Agricultural Research Library, Beltsville, Maryland, U.S.A.
5. Total Expenditure US \$ 51341
For details see following table.

1 Our Ref. No.: PROJECT 2859 (PROPOSAL C7-021)

2

PROJECTED DISBURSEMENT IN US\$
FOR THE PERIOD SEP. 1/88 - FEB. 28/89

EXPENDITURE	PROJECTION							SUB TOTAL PROJECTION	TOTAL UNTIL FEB 1989
	SEP	OCT	NOV	DEC	JAN	FEB			
Budget line									
Salaries	12.952	300	300	300	300	4.300	1.300	6.800	19.752
Overhead	10.268	125	125	775	600	3.200	700	5.525	15.793
Equipment	10.500	-	-	2.600	-	-	-	2.600	13.100
Travel & per diem	10.968	200	200	200	100	6.500	500	7.700	18.668
Other direct costs	6.653	-	-	-	2.000	2.000	1.000	5.000	11.653
Total	51.341	625	625	3.875	3.000	16.000	3.500	27.625	78.966

CR/005/PRO

1. RAINFALL DATA ANALYSIS

Rainfall data analysis continued as planned.

Following the rainfall intensity distribution analysis for the 3 stations in the Guanacaste Region, reported in the first progress report, a detailed analysis was carried out regarding the relationship between the total daily rainfall amounts (mm./day) and the maximum hourly intensities (mm./h⁻¹). In addition the relationship between the total daily rainfall amounts (mm.) and the rainfall duration (in h/min.) was analysed. A selection of the results obtained are presented in Fig.1.

The principal investigators will consider the possibility of preparing a scientific publication on the rainfall intensity analysis of the Guanacaste Region. In the mean time the following statements can be made, regarding the rainfall intensity regime of the region:

An analysis of the rainfall intensities of the north - western part of Costa Rica, based on 3 representative meteorological stations having a 12 year duration of records, show that the rainfall intensities follow a Gamma Distribution Pattern.

There are 2 distinct rainfall intensity populations. Very intense short duration events, usually precipitating up to 30 mm/day; and much less intense, extended duration events with a wide range of daily rainfall amounts.

The ratio of rainfall intensity (mm/h-1) to the total daily rainfall amount (mm/day) is very different for the two population groups. While for the first group this ratio is 2.5 - 3.5 and changes throughout the rainfall season, the second group has a uniform ratio of 0.5-0.6 throughout the rainfall season. The highly intensive rainfall events account for 20-35% of the total rainfall population.

2. CONSTRUCTION OF RUNOFF BATTERIES AND DELIVERY TO SITE

The construction of 5 sets of runoff batteries by Reiner Quesada Badilla has been completed on schedule by March, 1988, and during the months of April and May four runoff battery sets were transported from San Jose to Guanacaste. The location of the runoff batteries is as follows:

FARMER	REGION	LOCATION	Nº OF BATTERIES
Antonio Capella	Liberia	Frente al club Rotorio	2
Rice seed production Co. Finca El Porvenir	Filadelfia	Finca El Porvenir	1
John Breally	Santa Cruz	Hacienda Arroz El Guanacaste	1
Meteorological Institute	San Jose		1
Total			5

At the farm of al Seba Salazar near Cañas no rice was planted this year and in view of the uncertainty of upland rice cultivation on this rented property an alternative location is being looked for.

3. SELECTION OF EXPERIMENTAL PLOTS AND INSTALATION OF RUNOFF BATTERIES

During the months of June and July 7 field trips were made to the Guanacaste Region in order to select the location of the experimental plot and commence with the instalation of the runoff batteries. The following days were spent on site.

1.	08-09-10	June
2.	15-16-17	June
3.	23-24	June
4.	29-30	June
5.	06-07-08	July
6.	18-19-20-21	July
7.	27-28	July

The table below summarizes the present situation. In view of constant rainfall during the month of June and the heavy soil type, especially at Santa Cruz, progress with the instalation of the runoff batteries was slow and difficult.

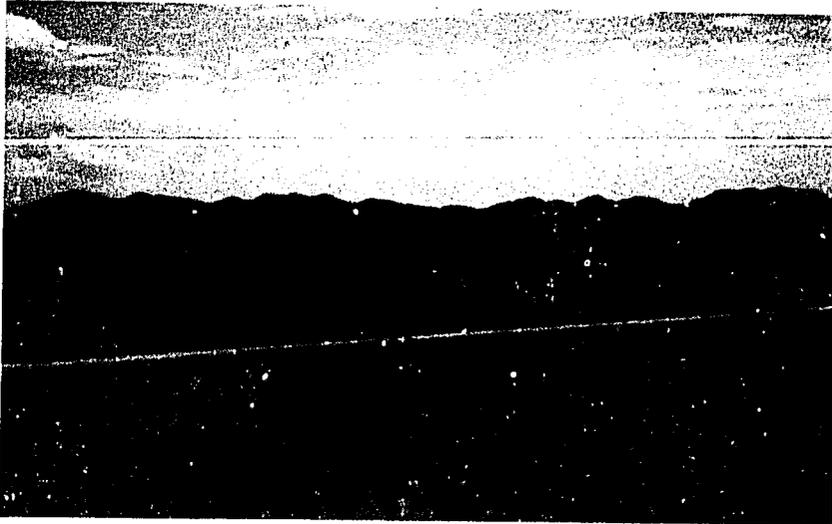
LOCATION		SELECTION OF PLOT	DELIVERY OF EQUIPMENT	INSTALA-TION	TESTING	OPERA-TIONAL
A. Capella Estate. Liberia	1.	+	+	+		
	2.	+	+			
Rice Seed Production Co. , Filadelfia	3.	+	+			.
J. Breally, Santa Cruz	4.	-+ To be changed	+			

An excellent site was obtained at Liberia and the runoff batteries instaled. An additional site has now been located and instalation of runoff batteries commence as soon as agreement has been obtained from A. Capella. The instalation of the runoff batteries at Santa Cruz had to be abandoned in view of the poor drainage facilities of the plot. An alternative plot has now been located and the batteries will be installed during the month of August.

Instalation of batteries at Filadelfia will take place during the month of August.

The goeographycal distribution and access roads to the runoff batteries are of operational importance. for the next 2 seasons of measurement, especilly the intensive observations during the reproductive period. The present "Layout" close to the main road of Liberia- Santa Cruz has much to be recomended.

EXPERIMENTAL SITES



SANTA CRUZ

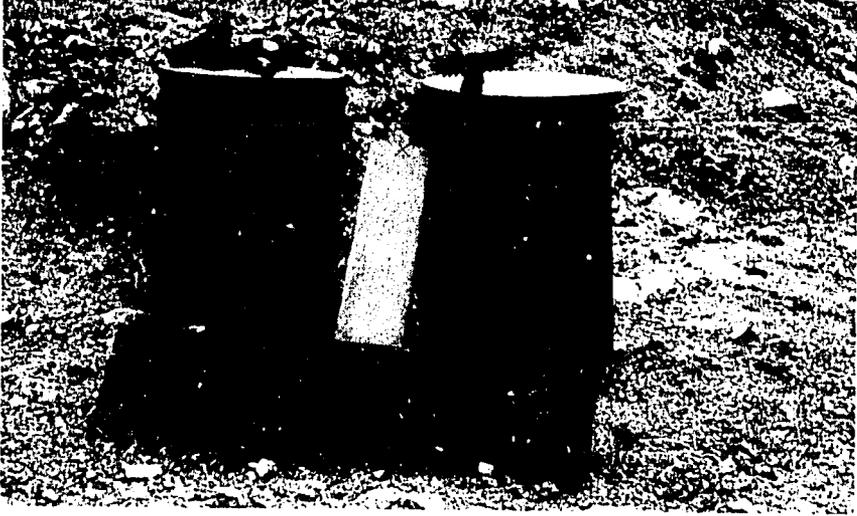


FILADELFIA

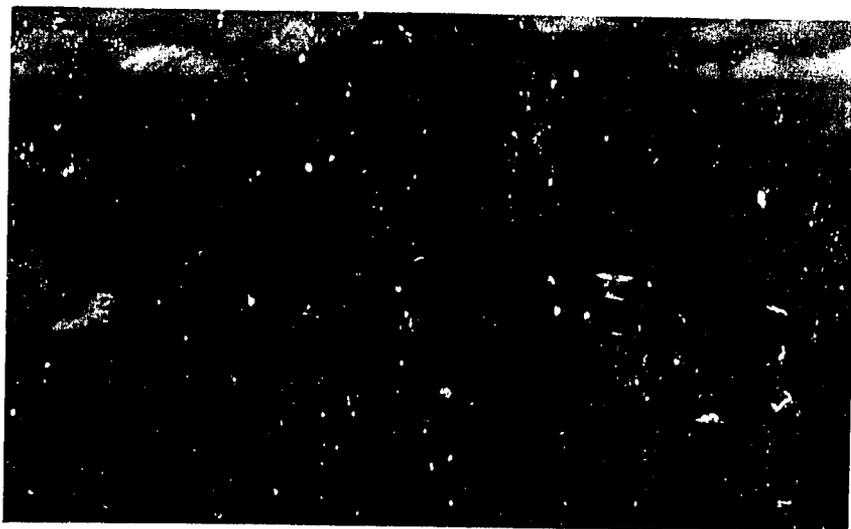
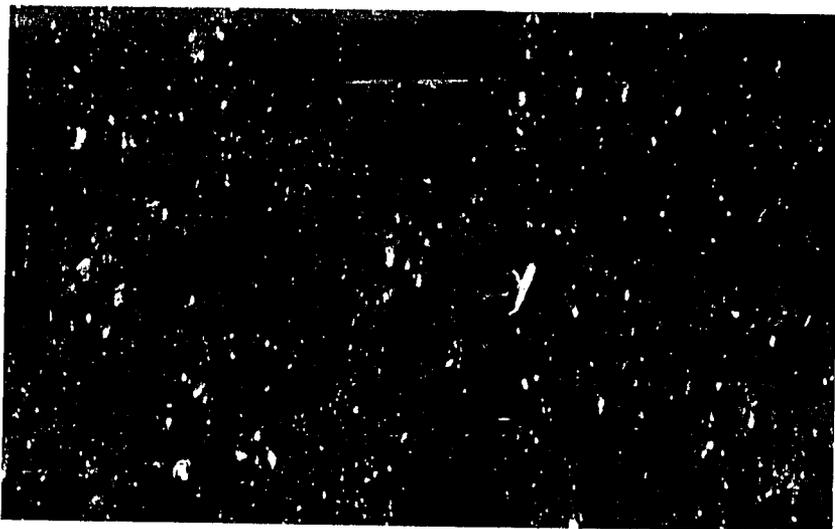


LIBERIA

RUNOFF BATTERIES



***DRAINAGE DIFFICULTIES
LIBERIA***



C7-021

U.S. - ISRAEL CDR PROGRAM AGENCY
FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C., U.S.A.

YIELD IMPROVEMENT OF UPLAND
RICE THROUGH MORE EFFICIENT
UTILIZATION OF RAINFALL
IN COSTA RICA

FIRST PROGRESS REPORT
SEPT. 1967 - FEB. 1968
GRANT No. DFE-5544-G-68-7000-0001

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Rec'd in SC1 APR 5 1968

**U.S. – ISRAEL CDR PROGRAM AGENCY
FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C., U.S.A.**

**YIELD IMPROVEMENT OF UPLAND
RICE THROUGH MORE EFFICIENT
UTILIZATION OF RAINFALL
IN COSTA RICA**

**FIRST PROGRESS REPORT
SEPT. 1987 – FEB. 1988
GRANT No. DPE-5544-G-SS-7026-00/01**

 **TAHAL
CONSULTING
ENGINEERS
LTD**

**February 1988
R-88-11**

TAHAL CONSULTING ENGINEERS LTD.

HEAD OFFICE: 54 REHOV IBN GVIROL TEL-AVIV, ISRAEL, TEL. 434434 TELEX 033-654 TELEFAX (972) 3-252981



29th February, 1988

Mr. B. Rock
Scientific Attache
U.S. Embassy
Tel-Aviv

Dear Sir,

**Subject: Grant No. DPE-5544-G-SS 7026-00/01
First Progress Report Sept. 1987 - Feb. 1988**

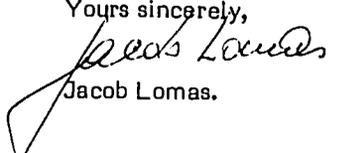
Please find enclosed one copy of the above Progress Report. Two additional copies have been sent to U.S.-Israel CDR Program Agency for International Development, Washington D.C.

The rainfall recording stations will cost considerably more than originally estimated, US.\$8,657 and not \$2,000. The equipment will be ordered from Ben Meadows Co., Atlanta, U.S.A. We hope that we can make some savings during 1989 that will provide most of the additional funds necessary.

I would like to obtain your consent for a short 4 - 5 day stopover at the Central Agriculture' Research Station at Beltsville, Maryland during my next trip to Costa Rica scheduled for August, 1988. I need this time for a literature search at the central library facilities.

This stopover will be within the allocated budget.

Yours sincerely,


Jacob Lomas.

U.S. - ISRAEL CDR PROGRAM AGENCY
FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. U.S.A

YIELD IMPROVEMENT OF UPLAND RICE THROUGH
MORE EFFICIENT UTILIZATION OF RAINFALL
IN COSTA RICA

FIRST PROGRESS REPORT
SEPT. 1987 - FEB. 1988
GRANT N DPE-5544-G-SS-7026-00/01

TAHAL CONSULTING ENGINEERS LTD.
FEB. 1988

EXECUTIVE SUMMARY

The Project was approved at the end of August 1987 and the first report deals with the six month period Sept. 1987 to Feb. 1988. During this period the following basic activities were carried out:

1. Analysis of some of the rainfall data.
2. Preparation of the equipment for the experiments at Guanacaste, Costa Rica.
3. Selection of the experimental sites.

Frequency distribution data of hourly rainfall intensities are presented. The runoff measuring equipment is under construction. Four of the five experimental sites have been selected. The rainfall stations are to cost some US\$5.656,25 more than expected.

The principal investigator was in Costa Rica from Jan. 10 to Feb. 12, 1988.

Total expenditure \$31.212 (for details see following table).

PROJECT No. DPE-5544-G-SS-7026-00/01
 Our Ref. No.: PROJECT 2859 (PROPOSAL C7-021)

PROJECTED DISBURSEMENT IN US\$
 FOR THE PERIOD DEC 1/87 - NOV 30/88

Budget line	EXPENDITURE			PROJECTION									
	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Total
Salaries		4,500	500	500			1,000	5,500	1,000	1,000	1,500	5,500	21,000
Overhead			6,240	375			950	3,375	438	250	562	3,600	15,790
Equipment		3,900	6,600										10,500
Travel & per diem		5,120						6,000	250		250	6,000	17,620
Other direct costs	2,012	2,100	240	1,000			2,800	2,000	500		500	2,900	14,052
Total	2,012	15,620	13,580	1,875			4,750	16,875	2,188	1,250	2,812	18,000	78,962

14/03/88

RAINFALL INTENSITIES ANALYSIS-RUNOFF

Rainstorms are the result of convection and other rain producing processes, which are most effective when they take place in potentially unstable, humid and warm airmasses. Such airmasses frequently prevail in the tropics and this is the main reason why rainstorms are a typical feature of the tropical climates. There are relatively few studies of tropical rainstorms, because data on them can only be obtained from a dense network of recording rain gauges (Orchard and Summer, 1970, 1972, Watts 1955).

There is no analysis of the rainfall intensities for the Guanacaste Region of Costa Rica and the first step was therefore to analyse the available rainfall charts for 3 stations in the region-Liberia, Cañas and Santa Cruz.

The rainfall intensities have been extracted from the recording station showing maximum rainfall amounts per 1 hour. These values have been grouped into 16-4 mm/h increments, i.e. 0.1-4.0 mm/h 4.1-8.0 mm/h 8.1-12 mm/h etc. The frequency analysis for 3 stations on a monthly basis is presented in fig. 1 to 3.

Rainfall intensities follow a gamma distribution pattern for all the 3 stations examined and for all the rainfall season. A comparison of the actually measured values at Liberia for the months of August with two theoretical distribution exponential curve show fairly good agreement.

$$P_1 = 8.67 X^{-1.06} \quad R^2 = 0.622$$

$$P_2 = 3.12 X^{-1.24} \text{ EXP. } -0.0226 \quad R^2 = 0.630$$

Fig. 4 presents the two distribution curves obtained.

The runoff phenomena has been discussed in detail by Chow (1964) and the difficulties involved in rainfall runoff relationships stated. The runoff coefficients provided in his table 14.1 have been used to calculate expected runoff for two soil types having a 2% - 7% slope, assuming that rainfall intensities greater than 10 mm/hour only are likely to cause runoff (Fairbrother and Manning 1952) and may even be liable to cause erosive effects (Duckham and Mosefield 1971). The percentage of hourly rainfall intensity values used in this calculation are given in tables 1 to 3.

Calculated expected runoff values in mm. during the months of august at 3 stations in the Guanacaste Region.

STATION	LIGHT SOIL	HEAVY SOIL
Liberia Lat. 10 37 n. Long. 85 26w	11.3-17.0	20.4-24.9
Cañas Lat. 10 25 n. Long. 85 05w	5.5 - 8.2	9.9- 12.1
Santa C. Lat. 10 16 n. long. 85 35w	8.8 -13.4	15.9-19.4

The long term mean rainfall amount for the month of august at Liberia is 161 mm. (1951-1980) and an expected runoff of 20-25 mm. is only 13-14 % of the monthly rainfall amount. The Calculated values seem to be rather low and maybe due to a number of reasons.

1- The assumption that the percentage of runoff is independant an the rainfall intensities, and

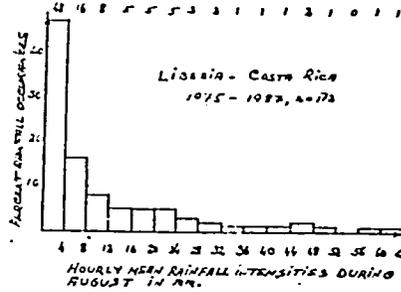
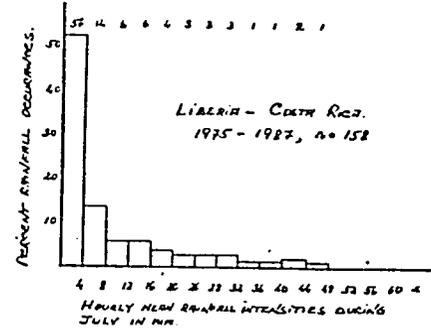
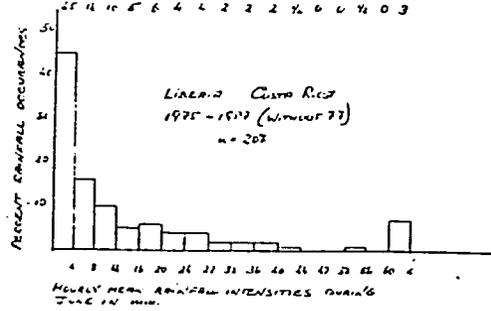
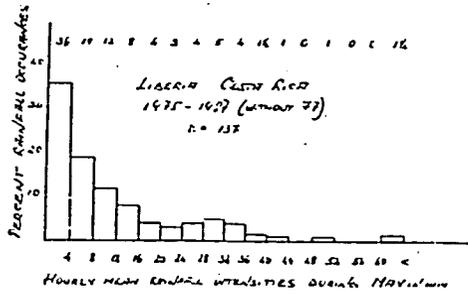
2- The assumption that runoff will occur only once rainfall intensities are above 10 mm./hour.

That runoff will depend on rainfall intensities is indicated by Suarez (1980) who showed that at rainfall intensities of 12 mm/h runoff was 0.2 mm while at rainfall intensities of 116 mm/h the runoff was 17.7 mm.

Plot size runoff experiments reported from Israel (Tamir, Morin and Steckelmacher, 1968) showed that the runoff was some 22.3 % of the seasonal rainfall. Should that be the case for the Guanacaste Region runoff could be expected to be twice the calculated values and be of the order of 30-40 mm. In such a case, and provided the runoff could be saved for the rice crop the expected increase in yield would be 180-240 kg./ha⁻¹ or an increase of some 10% of the mean yield reported at 2.170 kg /ha⁻¹ (Lomas and Herrera, 1985).

REFERENCES

- 1) Chow, V.T. 1964 Ed.
Handbook of applied Hydrology.
Mcgraw Hill Book Co. New York
- 2) Duckham, A.N. and G.B. Masefield 1971 Farming
systems of the world. Choatto and Windus London
- 3) Farbrother, H.G. and H.L. Manuing, 1952 EMP. COTT.
Growing Corp. Progress Repts. from Expt. Station
Namulange, 1951-52 p 3-6. / Bid. 1955-56 p. 16
- 4) Lomas, J. and H Herrera, 1985 Weather and Rice yield
relationships in Tropical Costa Rice. Agrig. and Forest.
Meteorol. 35: 133-151
- 5) Orchard, A.O. and Sumner, G.N. 1970.
Network Report N°. 4 East African Rainfall
Project. London, p. 58.
- 6) Orchard, A.O. and G.N. Sumner, 1972 Interm Report,
East African Rainfall Project, London p. 50.
- 7) Suarez de Castro, F. 1980. Conservacion de Suelos.
Instituto Interamericano de Cooperación para la
Agricultura. Material Educativo. N° 37 p. 315.
- 8) Tamir R;J. Morin and S Steckelmacher, 1968. The effect of
the Direction of Planting on Runoff and Soil Errosion Unaer
Rainfed Wheat in the South. Min. of Agric. Soil Conser. and
Drain. Div. Research unit. Hakiryá, tel-Aviv. Research N°. 20 (in Hebrew).
- 9) Taylor, C M. 1968, Rainfall Frequency-Intensity Data for
Kenya, Tanzania and Uganda, Nairobi, E.A.M.D. p. 15.
- 10) Watts, J E M. 1955, Rainfall on Singapore Island.
Tour. of Trop. GEography. 7: 43-53.



24/10/82

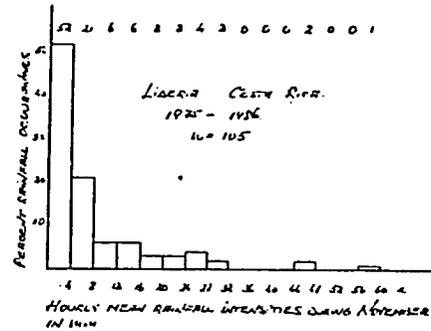
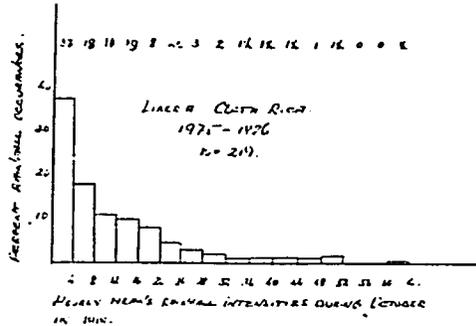
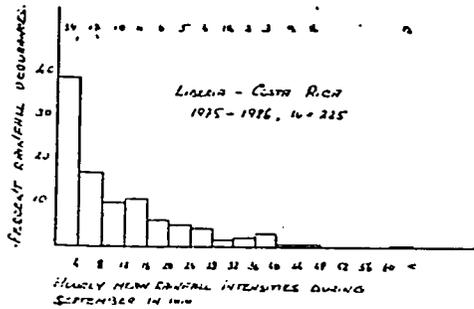


FIG. 1

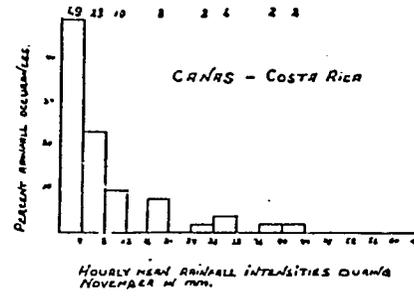
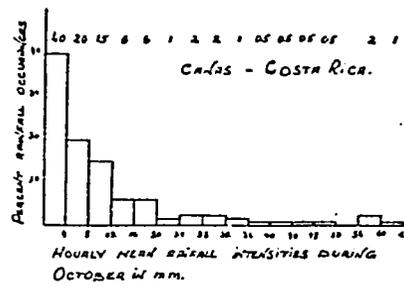
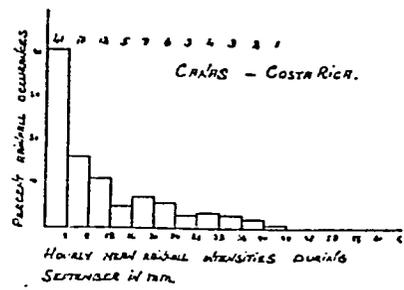
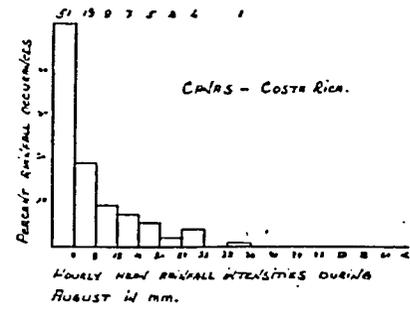
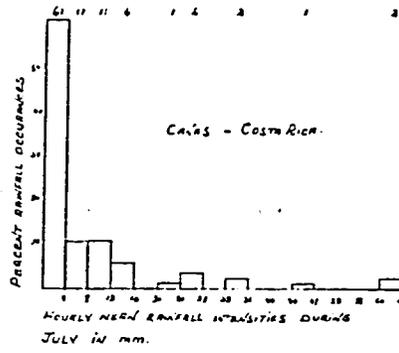
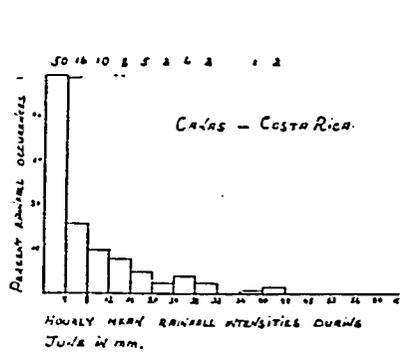


Fig. 2

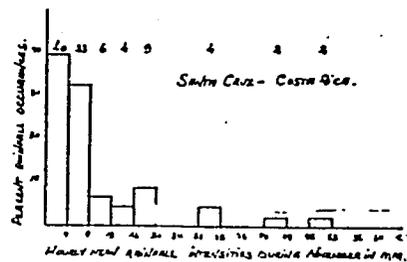
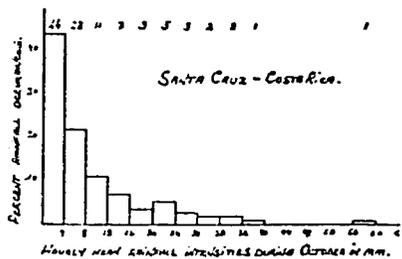
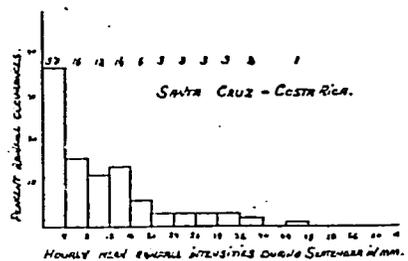
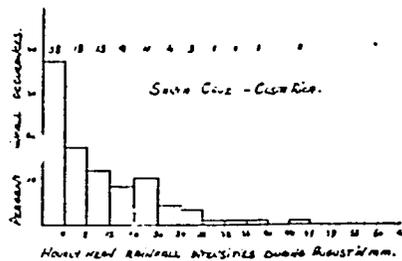
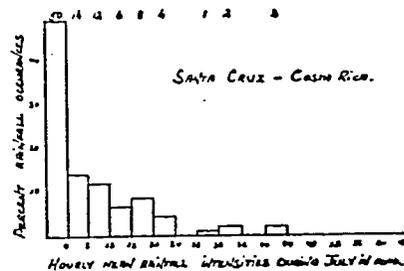
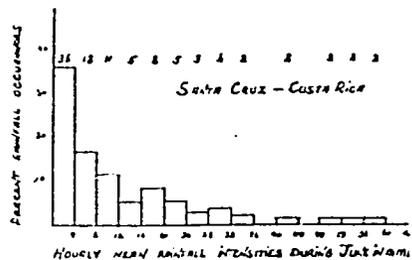
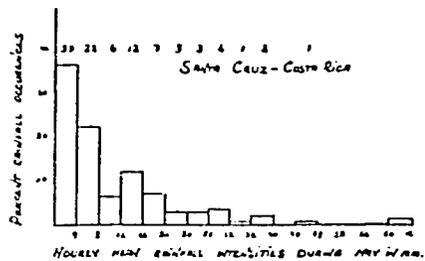
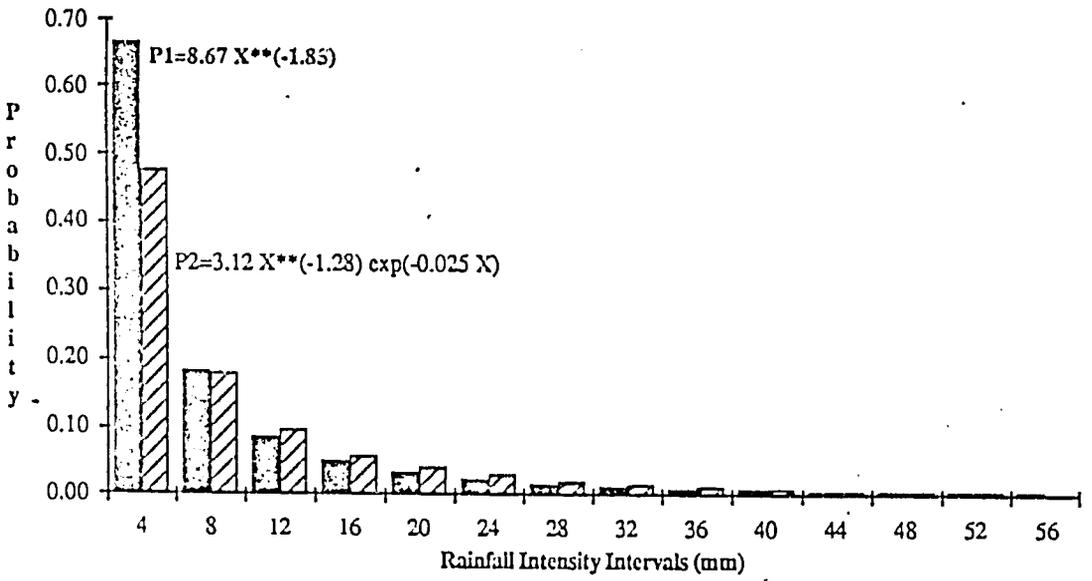


Fig. 3



Percentage of rainfall intensity of hourly values

CANAS
(1975 - 1987)

Month \ Rainfall Intensity \	0.1 to 4.0	4.1 to 8.0	8.1 to 12.0	12.1 to 16.0	16.1 to 20.0	20.1 to 24.0	24.1 to 28.0	28.1 to 32.0	32.1 to 36.0	36.1 to 40.0	40.1 to 44.0	44.1 to 48.0	48.1 to 52.0	52.1 to 56.0	56.1 to 60.0	60.1 to <	Means of rainedays	Range of rainedays
MAY																		
JUNE	50	16	10	8	5	2	4	2		1	2						13.6	11 - 17
JULY	61	11	11	6		1	4		2			2				2	9.2	5 - 16
AUGUST	51	19	10	7	5	2	4		2								11.6	7 - 19
SEPTEMBER	41	17	12	5	7	6	2	3	3	2	1						17.2	11 - 22
OCTOBER	40	20	15	6	6	2	2	2	1	1	1	1	1		1	1	16.5	10 - 23
NOVEMBER	49	23	10		8		2	4		2	2						7.3	3 - 13

Percentage of rainfall intensity of hourly values

LIBERIA
(1975 - 1987)

% Rainfall Month \ Intensity %	0.1 to 4.0	4.1 to 8.0	8.1 to 12.0	12.1 to 16.0	16.1 to 20.0	20.1 to 24.0	24.1 to 28.0	28.1 to 32.0	32.1 to 36.0	36.1 to 40.0	40.1 to 44.0	44.1 to 48.0	48.1 to 52.0	52.1 to 56.0	56.1 to 60.0	60.1 to (Means of raindays	Range of raindays
MAY	36	18	12	8	4	3	4	5	4	1.5	1	0	1	0	0	1.5	11.4	5 - 20
JUNE	45	17	10	5	6	4	4	2	2	2	0.5	0	0	0.5	0	3	17.2	11 - 27
JULY	59	14	6	6	4	3	3	3	1	1	2	1					12.2	8 - 10
AUGUST	48	16	8	5	5	5	3	2	1	1	1	2	1	0	1	1	13.6	6 - 18
SEPTEMBER	39	17	10	11	6	5	4	1.5	2	3	0.5	0.5	0	0	0	0.5	18.7	8 - 24
OCTOBER	37	18	11	9	8	4.5	3	2	1.5	1.5	1.5	1	1.5	0	0	0.5	18.2	12 - 25
NOVEMBER	52	21	6	6	3	3	4	2	0	0	0	2	0	0	1		8.7	4 - 15

Percentage of rainfall intensity of hourly values

SANTA CRUZ
(1975 - 1987)

Month	Rainfall Intensity																Means of raindays	Range of raindays
	0.1 to 4.0	4.1 to 8.0	8.1 to 12.0	12.1 to 16.0	16.1 to 20.0	20.1 to 24.0	24.1 to 28.0	28.1 to 32.0	32.1 to 36.0	36.1 to 40.0	40.1 to 44.0	44.1 to 48.0	48.1 to 52.0	52.1 to 56.0	56.1 to 60.0	60.1 to (
MAY	37	22	7	12	7	3	3	4	1	2	1					1	15.3	10 - 25
JUNE	36	18	11	5	9	5	3	4	2		2		2	1		2	16.2	13 - 20
JULY	50	14	12	6	9	4		1	2		2						10.2	6 - 15
AUGUST	40	18	13	9	13	4	4	1		1							13.8	6 - 19
SEPTEMBER	37	16	12	14	6	3	3	3	3	2		1					18.9	14 - 23
OCTOBER	44	22	11	6	4	5	3	2	2	1							14.7	7 - 22
NOVEMBER	40	32	6	4	9	1		4			2		2				5.7	2 - 9

ORDERING OF EQUIPMENT

1) RAINFALL RECORDING STATIONS.

Preliminary inquiries were made from the following instrument manufactures and their quotations were as follow.

1.1- weathertronics	Sacramento, California	\$ 2.021.00
1.2- Belfort	Baltimore	\$ 1.800.00
1.3- Ben meadows Co.	Atlanta, Georgia	\$ 1.225.00

All quotations do not include charts and are F.O.B therefore some \$ 1.000.00 has to be added for charts and some 25% for shipping insurance and other costs. The total cost now seems as follows.

5. rainfall recording stations	1.225.00	= \$ 6.125.00
25% shipment insurance etc.		\$ 1.531.25
Charts		\$ 1.000.00

TOTAL....		\$ 8.656.25

ORDERING RUNOFF PLOT EQUIPMENT

The design of the equipment to be used in the runoff experiments were taken from the field manual for research in agricultural hydrology U.S.D.A. Agricultural handbook 1979. The drawings were enlarged and two multislots divisors were brought from Israel by the principal investigator. The drawings and samples were thus discussed with some workshops and the workshops of Reiner Quesada Badilla Chosen. The equipment ordered consisted of:

ITEM	UNITS	COSTS	TOTAL
Large drainage tanks	5x2=10	68	680
Small drainage tanks	5x4=20	10	200
Divisors	5x4=20	20	400
collectors	5x2=10	87	870

			2.150.00

The equipment was ordered on Jan 15, 1988 for delivery within 6 weeks.

SELECTION OF SUITABLE EXPERIMENTAL SITES

The major objective of the present visit was to select 5 locations for the experiments. With this aim in view and in order to obtain the necessary good will of the local farmers in Guanacaste we contacted the Camara de Granos Basicos and met its Director on Tuesday January 19, 1988. The meeting was favorable, and Ing. Antonio Cappella Segreta not only promised to put a positive recommendation to the board but invited us to be present at the meeting in order to explain the practical objectives of the project. Furthermore he offer his own farm (4 Km. outside Liberia) as one of the possible sites for experimentations. On Thursday 21 Jan. 88 we visited the Rice Office in San Jose in order to inform the corporation of the project and had a useful discussion with its managing Director Lic. Luis Polinaris. The Director also made some suggestions regarding possible selections of farmers in The Guanacaste region.

The proposals were presented to the board of the Camara de Granos Basicos on Jan. 25 1988 and Mr. H. Herrera and myself visited the farmers in Guanacaste on Feb. 2 and 3rd 1988. Four of the five proposed sites were selected during the visit. The fifth site was found unsuitable and an additional location will have to be found. The 4 selected sites are presented in table 1.

TABLE 1
Selected locations for experiments

FARMER	REGION	LOCATION
Agricultor Al Seba Salazar (Prop. Alberto Aldenor) Tel: 25-2256 Alseba Salazar 22-0515 Alberto Aldenor	Finca Cañas	Direction Ruta hacia el Ferry Tempisque Km. 14
Antonio Capella Presidente C.G.B. Santa Ana Tel: 28-6017	Liberia	Frente al Club Rotario

