EXPERIMENTAL PROCEDURES FOR GRAIN CROPS RESEARCH ON THE BRUMDEC PROJECT

IICA/JAMAICA
Miscellaneous Publication #318
ISSN-0534-5391

EXPERIMENTAL PROCEDURES FOR GRAIN CROPS RESEARCH ON THE BRUMDEC PROJECT.

by

Claude Grand-Pierre
Grain Production Specialist
IICA/JAMAICA

January 1982

BLACK RIVER UPPER MORASS DEVELOPMENT COMPANY LIMITED

EXPERIMENTAL PROCEDURE

1. EXPERIMENT Relevance of Production Factors

2. CROPS Corn and Sorghum

3. OBJECTIVES

(i) To identify the most critical production factors under the project area conditions of BRUMDEC.

(ii) To determine the effect of with-holding one practice from the complete set of basic production practices.

4. TREATMENTS

In each plot the Basic Production Package (BPP) is applied or the BPP minus one factor.

The BPP consists of: N,P,K application + Minor elements application + improved variety + optimum population density + use of insecticide/Fungicide + use of herbicide.

N°	INPUTS
1	BPP (all factors applied)
2	BPP-N (No N applied)
3	BPP-P (No P applied)
4	BPP-K (No K applied)
5	BPP-M.E (No minor elements applied)
6	BPP-I (No insecticide applied)
7	BPP-H (No herbicide applied)
8	BPP-D (Other population density)
9	V-only (No N,P,K,M.E, I or H used)

5. EXPERIMENTAL DESIGN

A randomized complete Block Design having four (4) replications.

6. PLOT SIZE

Six (6) rows, 10m long with 0.80m between rows.

7. BASIC PRODUCTION PACKAGE

INPUTS	PEAT SOIL	WALLENS &	CABHEW CLAY
Kg N/Ha	0	100	100
Kg P_2O_5/Ha	60	80	80
Kg K_2O/Ha	100	100	100
Mn (Chelate 12%)/Ha	0.60	0.60	0.60
Zn (Chelate 14.2%)Ha	0.50	0.50	0.50
Fe (Chelate 6%)/Ha	0.60	0.60	0.50
Population density (corn)	50.000	37.500	
Population density (Sorghum)	212.000	140.000	
Kg/Ha Furadan (5% a.i)	12.5		
Kg/Ha Sevin (80% a.i)	3.5		
Kg/Ha Gesaprim Combi 80	2.5		

8. CULTURAL PRACTICES

8.1 Soil Preparation:

Do not over-work the soil with tillage operations. Plowing and one harrowing should be sufficient if properly done.

8.2 Ridging :

Mark the boundaries of your group of experiments, considering roads and alleys and adding about 10% to the overall length.

8.3 Marking the individual experiments:

The numbering of plots should always go from left to right, starting from the beginning of the extreme left row, place a stake. Considering the row as one side or leg (catheter) or a right angle triangle, a right angle (90°) should be constructed at the corner. A right angle triangle, with sides measuring 3,4 and 5m long will produce perfect plots. The 3m side is marked along the ridge, 4m side across the rows and the 5m side is the hypotenuse. The direction of the side across the rows will be the base for the experimental plots. Place the stakes at the corners of each block of plots, leaving 1 or 2 blanks or unplanted rows

between experiments and either 1 or 2m alleys between blocks.

8.4 Fertilizer Application

Carefully weigh each split dose of fertilizer. Put each dose of fertilizer in a different cup and mark the level. For a more even distribution of the fertilizer along the row, in each case, take a levelled measure of the corresponding fertilizer and place half the amount of the fertilizer in the bottom of the furrow going one way and the other half should be placed in the same furrow on the way back. The fertilizer should be slightly covered with soil in the furrow.

8.5 Planting

There are two possible densities for each crop. Thinning operations should be carried out when plant height reaches 10-15 cm. Because of this, it is necessary to plant about 30% more seeds than the desired population.

8.6 Rows Per Plot

Except for special cases, all plots for experiments in step 1 consist of 6 rows.

8.7 Border Rows

In those cases where the experimental plots consist of only 4 rows, a border row should be planted on the sides of each block having the same treatment as the adjacent plot.

8.8 Soil Application of insecticide

Insecticides are applied directly in the hole with the seeds. Apply 500 gm a.i. Aldrin/ha or 600 gm a.i./ha of carbofuran (Furadan) in the holes at planting time. When possible, it is preferable to use seed coated with Furadan.

8.9 Early stage insect control

In experiments other than insecticide trials, insects attacking plant at early stages can be controlled by spraying a solution of insecticide for the control of the insects.

8.10 Weed Control

For conventional tillage experiments, a herbicide is applied immediately after planting.

For hand weed control, clean with a hoe within two weeks of planting and again at 45-60 days. In sites well prepared by tractor and are clean of weeds at planting, one hand weeding at 45-60 days is sufficient.

8.11 General Data to be recorded

1. Days to flowering

   Record the number of days elapsed from planting to 50% silking.

2. Plant height

   An average reading of 10 randomly selected plants in the two central rows, measuring from ground level to the top in centimetres.

3. Plants harvested

   The total number of plants at harvest time in the harvested area.

4. Field Weight

   The total weight of all the harvested ears, panicle, pods, etc, per plot weighed in tenths of kilograms.

5. Percentage Moisture

   Record percent moisture at harvest as a mean value for each plot using a sample.

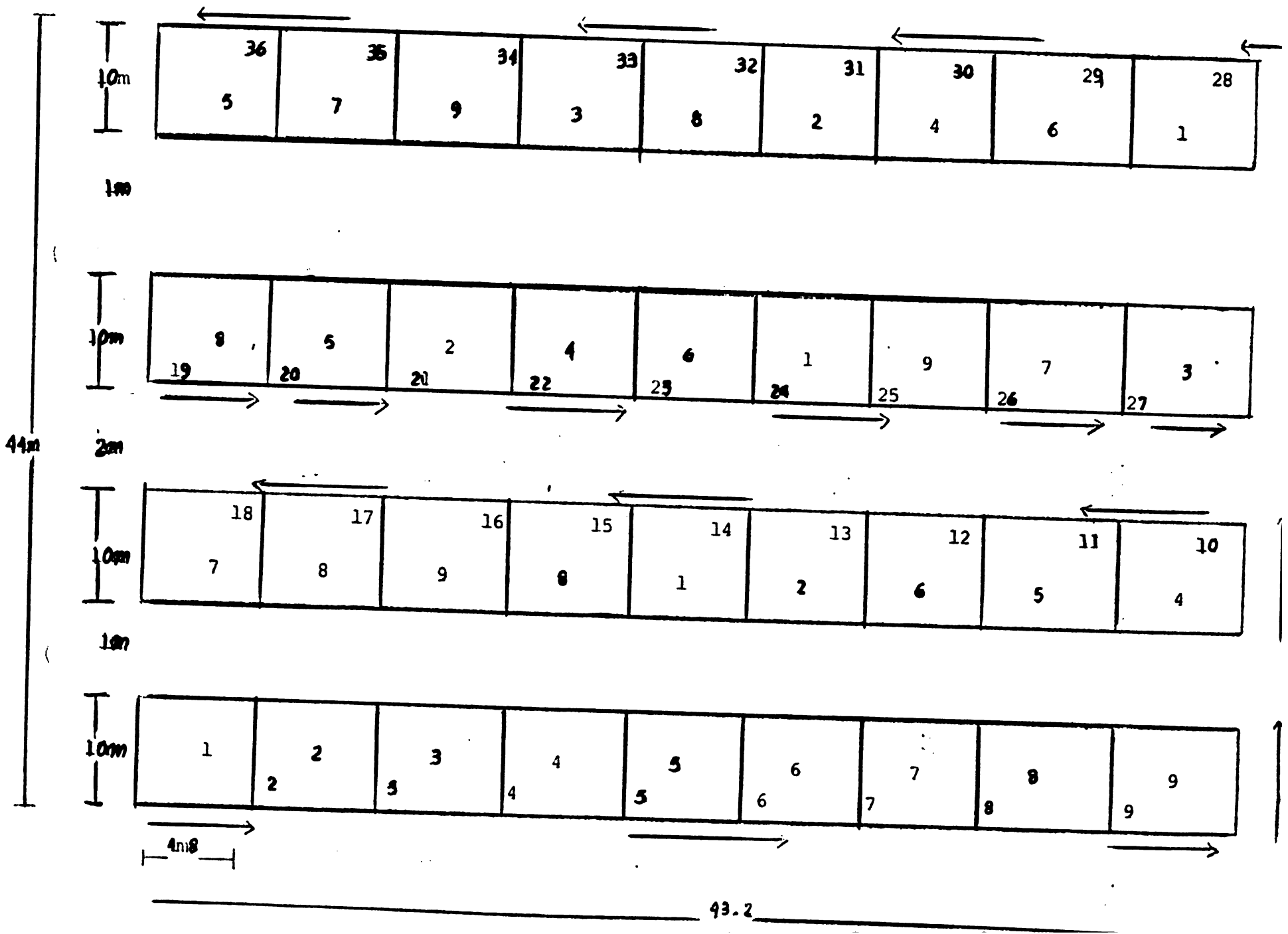
6. Diseases

   Use a scale of 1 (free) to 5 (very diseased) to evaluate diseases.

7. Insects

   Record damage using a scale of 1 to 5 as above.

FIELD PLAN - RELEVEVANCE OF PRODUCTION FACTORS



BASIC DATA

EXPERIMENTS Relevance of Production Factors.

1. **CROPS**

   Corn and Sorghum

2. **SIZE PLOT**

   Nine (9) treatments with four (4) replications.

CROPS	Length of rows (m)	Distance between rows (m)	Rows Per Plot	Plot surface M2	Surface per replication	Surface per experiment	Total surface with alleys
Corn	10	0.80	6	48	432	1728	1900
Sorghum	10	0.80	6	48	432	1728	1900

3. **FERTILIZER APPLICATION**

   3.1 - Morass Peat - 152'

CROPS	Sulphate of Amonia (21%)			Triple Super Phosphate (46%)			Muriate of Potash (60%)		
	Kg/Ha	Kg/Trial	Kg/Plot	Kg/Ha	Kg/Trial	Kg/Plot	Kg/Ha	Kg/Trial	Kg/Plot
Corn	-	-	-	130.2	22.5	0.62	170	29.2	0.81
Sorghum	-	-	-	130.2	22.5	0.62	170	29.2	0.81

* N as Sulphate of Amonia = 0

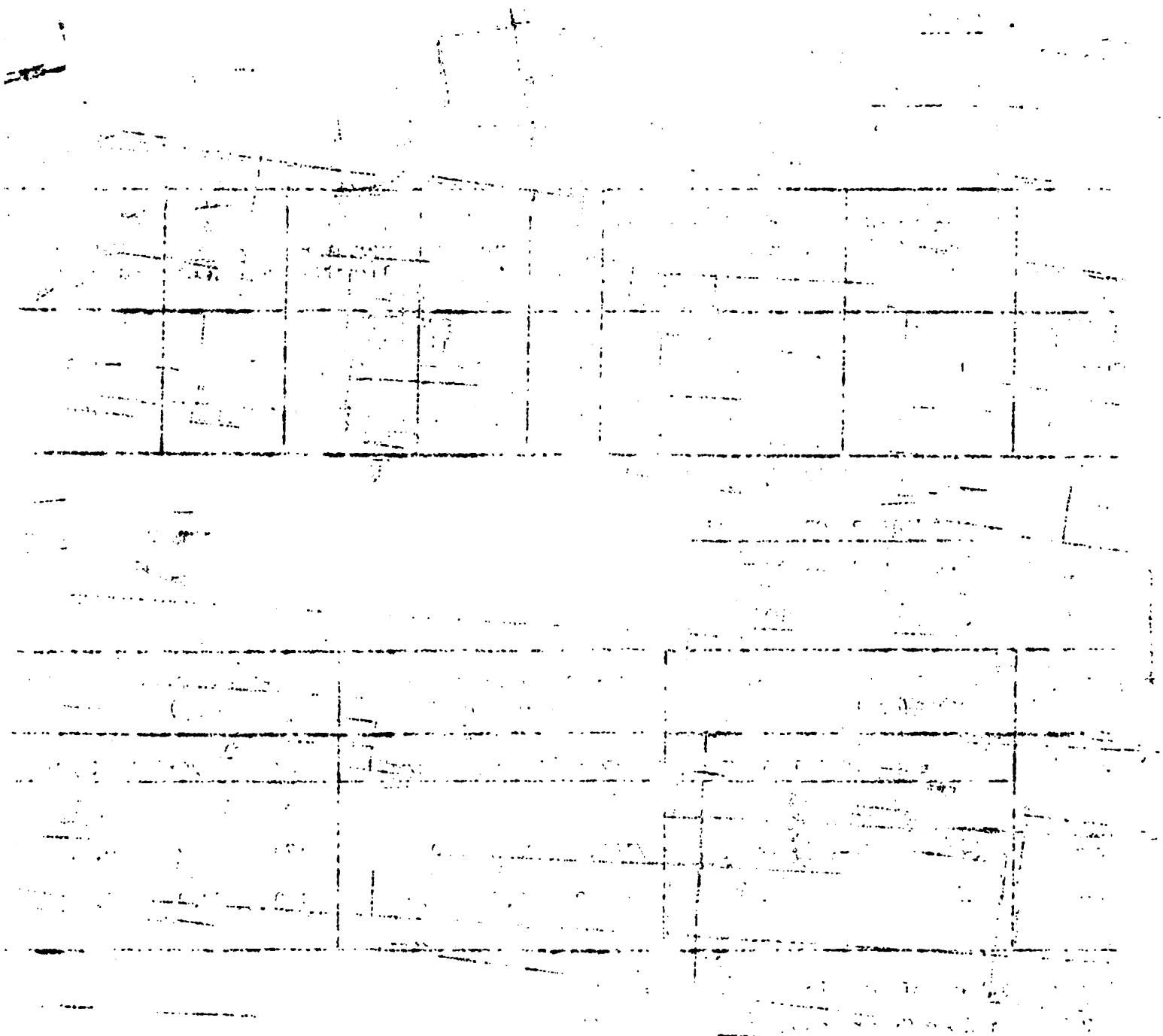
P_2O_5 as triple Superphosphate = 60 Kg/Ha

K_2O as Muriate of Potash = 100 Kg/Ha

MnEDTA as Manganese Chelate (12%) = 0.Kg 60/Ha (foliar application)

Zn EDTA as Zinc Chelate (14.2%) = .Kg 50/Ha (foliar application)

Fe EDTA as Iron Chelate (6%) = 0.Kg 60/Ha (foliar application)



3.2 - VALLENS CLAY - 9A AND CASHEW CLAY LOAM - 151[2]

CROPS	Sulphate of Ammonia 21%			Triple Superphosphate 46%			Muriate of Potash 60%		
	Kg/Ha	Kg/Trial	Kg/Plot	Kg/plot	Kg/Trial	Kg/Plot	Kg/Ha	Kg/Trial	Kg/Plot
Corn	476	82	2.27	173.6	30.0	0.85	170	29.2	0.81
Sorghum	476	82	2.27	173.6	30.0	0.85	170	29.2	0.81

2)

N. as Sulphate of Ammonia = 100 Kg/Ha

P_2O_5 as Triple Superphosphate = 80 Kg/Ha

K_2O as Muriate of Potash = 100 Kg/Ha

4. PLANTING

CROPS	Distance between plants (m)	No. plants per row	No. Seeds per hill	Thinning	Population Density/Ha
Corn	0.50	40	3-4	2	50.000
	0.50	30	2-3	1-2	37.5000
Sorghum	0.06	170	-	1	212.500
	0.10	100	-	1	125.000

5. INSECTICIDE/FUNGICIDE APPLICATION

CROPS	Insect/Fung.		Kg/Ha	Kg/Trial
Corn	Furadan	(5% i.a.)	12.5	2.16
	Sevin	(80% w.p.)	3.5	0.60
Sorghum	Furadan	(5% i.a.)	12.5	2.16
	Sevin	(80% w.p.)	3.5	0.60
Cowpea	Diazinon		2.5	0.25
	Malathion		2.5	0.25

6. HERBICIDE APPLICATION

CROPS	HERBICIDE	Kg/Ha	Kg/Trial
Corn	Gesaprim Combi 80	2.5	0.45
Sorghum	Gesaprim Combi 80	2.5	0.45
Cowpea	Probe	1.7	0.70

BLACK RIVER UPPER MORASS DEVELOPMENT COMPANY LIMITED
(BRUMDEC)

EXPERIMENTAL PROCEDURE

EXPERIMENT BASIC FERTILIZER EXPERIMENT

CROPS CORN AND SORGHUM

OBJECTIVES

(i) To compare the yield response due to three (3) different fertilizer nutrients under the Project area conditions.

(ii) To identify significant interactions between fertilizer nutrients.

TREATMENTS

NO	PEAT SOIL	WALLEN AND CASHEW CLAY
N_o	0	0
N_1	20	50
N_2	50	100
P_o	0	0
P_1	50	50
P_2	100	100
K_o	0	0
K_1	50	50
K_2	100	100

A standard application of 0.Kg 60/Ha of Manganese Chelate (12%) OKg 50/Ha of zinc chelate (14.2%) and OKg 60/Ha of Iron Chelate (6%) will be used (foliar application) to all the plots.

EXPERIMENTAL DESIGN

A 3x3x3 factorial arranged in blocks of nine (9) treatments with two (2) replications.

PLOT SIZE

Six (6) rows, 5m long with 0.80m between rows.

COMBINATION OF FERTILIZERS

The different combinations of fertilizers are the following:

01-000	(N_o P_o K_o)
02-001	(N_o P_o K_1)
03-002	(N_o P_o K_2)
04-010	(N_o P_1 K_o)
05-011	(N_o P_1 K_1)
06-012	(N_o P_1 K_2)
07-020	(N_o P_2 K_o)
08-021	(N_o P_2 K_1)
09-022	(N_o P_2 K_2)
10-100	(N_1 P_0 K_o)
11-101	(N_1 P_0 K_1)
12-102	(N_1 P_o K_2)
13-110	(N_1 P_1 K_o)
14-111	(N_1 P_1 K_1)
15-112	(N_1 P_1 K_2)
16-120	(N_1 P_2 K_o)
17-121	(N_1 P_2 K_1)
18-122	(N_1 P_2 K_2)
19-200	(N_2 P_o K_o)
20-201	(N_2 P_o K_1)
21-202	(N_2 P_o K_2)
22-210	(N_2 P_1 K_o)
23-211	(N_2 P_1 K_1)
24-212	(N_2 P_1 K_2)
25-220	(N_2 P_2 K_o)
26-221	(N_2 P_2 K_1)
27-222	(N_2 P_2 K_2)

CULTURAL PRACTICES

(See Experimental Procedure for Relevance of Production Factors Experiment).

DATA TO BE RECORDED

All observations are made on the two (2) Central rows only:-

(i) Days to flowering

(ii) Plant height

(iii) Plants harvested

(iv) Field Weight

(v) Percentage of moisture

(vi) Diseases

(vii) Insect Damage

FERTILIZER APPLICA

FERT.UNIT	SULPHATE OF AMMONIA 21%			TRIPLE SUPERP 46%	
	Kg/Ha	Kg/Trial	Kg/Plot	Kg/Ha	Kg/T
20	95.2	12.4	0.25	43.4	5.
50	238.0	30.9	0.50	108.5	14.
100	476.0	61.7	1.15	217.0	28.

4. PLANTING (see Relevance of Production Factors Experiment)

5. INSECTICIDE/FUNGICIDE APPLICATION (IDEM)

6. HERBICIDE APPLICATION (IDEM)

FIELD PLAN FOR BASIC FERTILIZER EXPERIMENT

5m

211	211	200	210	100	012	202	122	021
54	53	52	51	50	49	48	49	50

001	121	120	212	112	002	020	101	022
45	44	43	42	41	40	39	38	37

201	221	010	111	222	110	000	102	220
36	35	34	33	32	31	30	29	28

1	2	3	4	5	6	7	8	9
221	110	222	201	112	020	003	120	000

10	11	12	13	14	15	16	17	18
110	010	102	111	100	011	122	211	021

19	20	21	22	23	24	25	26	27
220	202	022	001	210	012	212	200	101

43.2m 1m 43.2m 1m 43.2m

131.6m

AGRICULTURE IN JAMAICA

Collection of papers of the Office of IICA in Jamaica

1977 - 1978

No. I - 1 Fritz Andrew Sibbles, "Basic Agricultural Information on Jamaica Internal Document of Work", January 1977

No. I - 2 Yvonne Lake, "Agricultural Planning in Jamaica", June 1977

No. I - 3 Aston S. Wood, Ph. D., "Agricultural Education in Jamaica", September - October 1977

No. I - 4 Uli Locher, "The Marketing of Agricultural Produce in Jamaica", November 1977

No. I - 5 G. Barker, A. Wahab, L. A. Bell, "Agricultural Research in Jamaica", November 1977

No. I - 6 Irving Johnson, Marie Strachan, Joseph Johnson, "Land Settlement in Jamaica", December 1977

No. I - 7 Government of Jamaica, "Agricultural Government Policy Papers", February 1978

No. I - 8 Jose Emilio Araujo, "The Communal Enterprise", February 1980

No. I - 9 IICA and MOAJ, "Hillside Farming Technology - Intensive Short Course", Vols, I and II, March 1978

No. I - 10 Jose Emilio Araujo, "The Theory Behind the Community Enterprise - Seminar in Jamaica", March 1978

No. I - 11 Marie Strachan, "A National Programme for the Development of Hillside Farming in Jamaica", April 1978

No. I - 12 D. D. Henry, "Brief Overall Diagnosis of Hillside Farming in Jamaica", April 1978

No. I - 13 Neville Farquharson, "Production and Marketing of Yams in Allsides and Christiana", May 1978

CULTURAL PRACTICES

(See Experimental Procedure for Relevance of Production Factors Experiment).

DATA TO BE RECORDED

All observations are made on the two (2) Central rows only:-

(i) Days to flowering

(ii) Plant height

(iii) Plants harvested

(iv) Field Weight

(v) Percentage of moisture

(vi) Diseases

(vii) Insect Damage

FERTILIZER APPLICAT

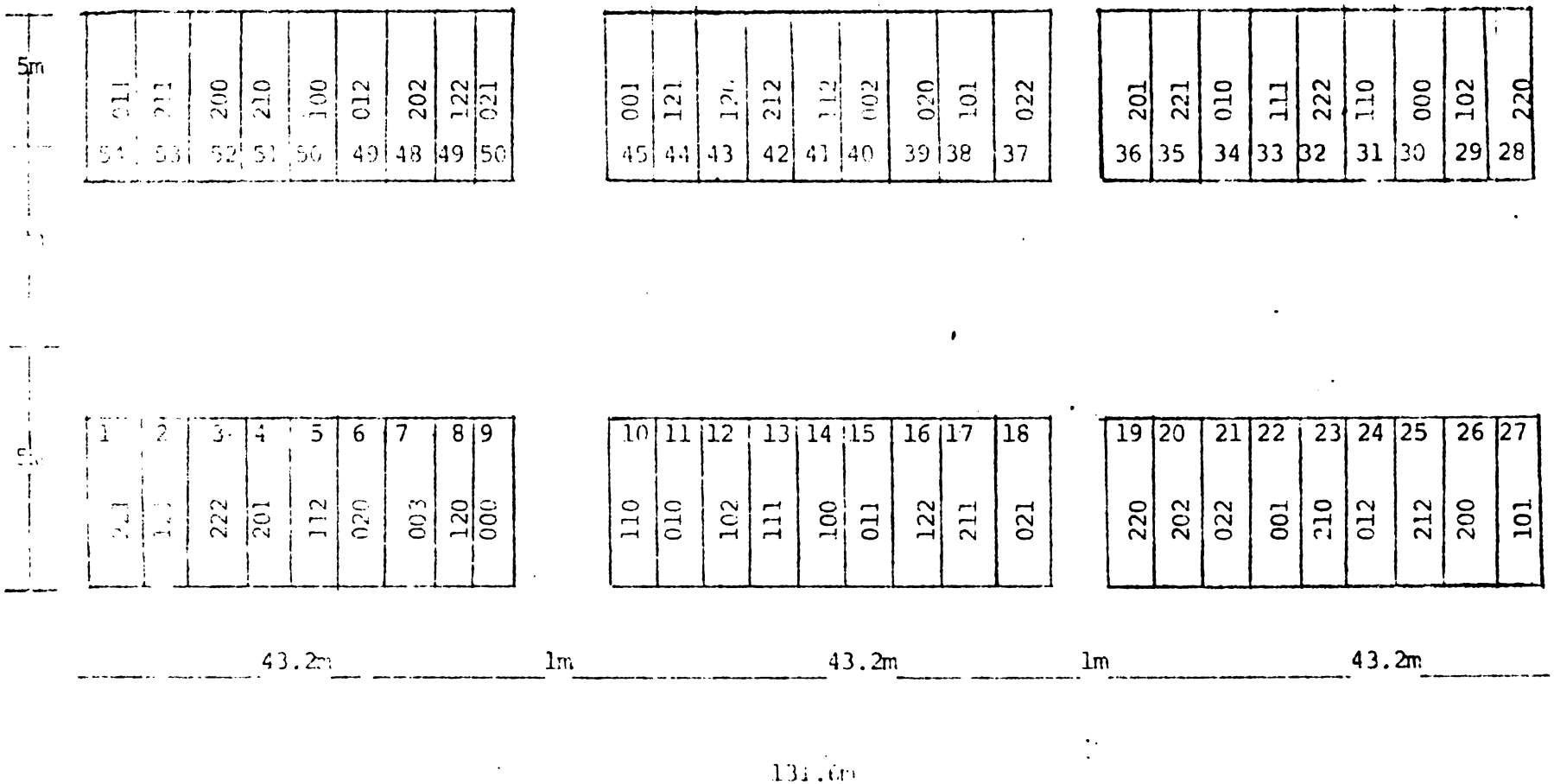
FERT. UNIT	SULPHATE OF AMMONIA 21%			TRIPLE SUPERPH 46%	
	Kg/Ha	Kg/Trial	Kg/Plot	Kg/Ha	Kg/Tr
20	95.2	12.4	0.25	43.4	5.6
50	238.0	30.9	0.50	108.5	14.0
100	476.0	61.7	1.15	217.0	28.1

4. PLANTING (see Relevance of Production Factors Experiment)

5. INSECTICIDE/FUNGICIDE APPLICATION (IDEM)

6. HERBICIDE APPLICATION (IDEM)

FIELD PLAN FOR BASIC FERTILIZER EXPERIMENT



AGRICULTURE IN JAMAICA

Collection of papers of the Office of IICA in Jamaica

1977 - 1978

No. I - 1 Fritz Andrew Sibbles, "Basic Agricultural Information on Jamaica Internal Document of Work", January 1977

No. I - 2 Yvonne Lake, "Agricultural Planning in Jamaica", June 1977

No. I - 3 Aston S. Wood, Ph. D., "Agricultural Education in Jamaica", September - October 1977

No. I - 4 Uli Locher, "The Marketing of Agricultural Produce in Jamaica", November 1977

No. I - 5 G. Barker, A. Wahab, L. A. Bell, "Agricultural Research in Jamaica", November 1977

No. I - 6 Irving Johnson, Marie Strachan, Joseph Johnson, "Land Settlement in Jamaica", December 1977

No. I - 7 Government of Jamaica, "Agricultural Government Policy Papers", February 1978

No. I - 8 Jose Emilio Araujo, "The Communal Enterprise", February 1980

No. I - 9 IICA and MOAJ, "Hillside Farming Technology - Intensive Short Course", Vols, I and II, March 1978

No. I - 10 Jose Emilio Araujo, "The Theory Behind the Community Enterprise - Seminar in Jamaica", March 1978

No. I - 11 Marie Strachan, "A National Programme for the Development of Hillside Farming in Jamaica", April 1978

No. I - 12 D. D. Henry, "Brief Overall Diagnosis of Hillside Farming in Jamaica", April 1978

No. I - 13 Neville Farquharson, "Production and Marketing of Yams in Allsides and Christiana", May 1978

No. I - 14 R. C. E. McDonald, A. H. Wahab, "Fertility Assessment of Newly Terraced Hillside Soils Using the Microplot Technique - the Allsides Case Study", 1978

No. I - 15 IICA - IDB, "Course in Preparation and Evaluation of Agricultural Projects", Vols. I and II, November 1977

No. I - 16 Neville Farquaharson, "Production and Marketing of Dasheen in Allsides and Christiana", June 1978

1978 - 1979

No. II - 1 O. Arboleda-Sepulveda (IICA-CIDIA), "Agricultural Documentation and Information Network in Jamaica", September 1978

No. II - 2 Victor Quiroga, "National Agricultural Information System", (NAIS-Jamaica) Project Profile, September 1978

No. II - 3 Joseph Johnson, "A Review on Land Reform in Jamaica for the Period 1972 - 1978", September 1978

No. II - 4 Neville Farquharson, "ABC of Vegetable Farming", A Draft High School Textbook, Vols. I, II, III and IV, February 1979

No. II - 5 Jerry La Gra, "Elements of an Agricultural Marketing Strategy for Jamaica", March 1979

No. II - 6 D. D. Henry, I. E. Johnson, "Agricultural Extension Service in Jamaica", March 1979

1979 - 1980

No. III - 1 H. R. Stennett, "Watersheds of Jamaica and Considerations for an Ordinal Scale of Their Development", July 1979

No. III - 2 IICA-MAJ, "Hillside Farming in Jamaica", A Training Seminar, December 1978

No. III - 3 A. L. Wright, A. H. Wahab, H. Murray, "Performance of Six Varieties of Red Peas (Phaseolus vulgaris L.) on a Newly Terraced Ultisol in Jamaica", September 1979

No. III - 4 IICA Jamaica Staff, "Agro-Socio-Economic Sample Survey of Allsides - Trelawny, Jamaica", September 1979

No. III - 5 IICA-MOAJ, "An Approach to Agricultural Settlement of Hilly Lands", October 1979

No. III - 6 IICA-MOAJ, "Tree Crops of Economic Importance to Hillside Farms in Jamaica", October 1979

No. III - 7 Canute McLean, "Production and Marketing of Peanuts", November 1979

1980

No. IV - 1 Joseph Johnson, "Production and Marketing of Red Peas in the Hilly Areas of Jamaica", January 1980

No. IV - 2 Lyn Snuffer, "Rural Women: An Annotated Caribbean Bibliography with special reference to Jamaica", January 1980

No. IV - 3 Vincent Campbell, Abdul Wahab, Howard Murray, "Response of Peanut (Arachis hypogaea L.) on a Newly Terraced Ultisol in Jamaica", January 1980

No. IV - 4 P. Aitken, A. Wahab, I. Johnson, A. Sahni, "Agro-Socio-Economic Survey - Pilot Hillside Agricultural Project 'PHILAGRIP' Southern Trelawny," February, 1980

No. IV - 5 Glenys H. Barker, "Bibliography of Literature relating to Research and Development in the Agricultural Sector of Jamaica 1959 - 1979", March 1980

No. IV - 6 Milton R. Wedderburn, "Allsides Farmers' Pre-Cooperative A Socio-Economic Assessment", March 1980

No. IV - 7 Adele J. Wint, "The Role of Women in the Development Process", April 1980

No. IV - 8 Milton R. Wedderburn, "The Co-operative Input in the Development of the Pilot Hillside Agricultural Project (PHILAGRIP)", April 1980

No. IV - 9 MOJ/IICA/CARDI, Fruit Trees Seminar -"Research & Development of Fruit Trees", June 1980

No. IV - 10 Henry Lancelot, "Traditional Systems in Hillside Farming, Upper Trelawny, Jamaica", June 1980

No. IV - 11 IICA/Jamaica, "Pilot Hillside Agricultural Project", (PHILAGRIP), Project Document. Vols. I, II and III, June 1980

No. IV - 12 A. Wahab, I. Johnson, P. Aitken, H. Murray and H. Stennett, "Highlights of the Pilot Hillside Agricultural Project at Allsides", July 1980

No. IV - 13 I. Johnson, A. Wahab, P. Aitken, H. Payne, "Benchmark for a Project Profile for Developing a Peanut Industry in Jamaica", July 1980

No. IV - 14 P. Aitken, A. Wahab, I. Johnson, "The Allsides Post Peasant", August 1980

No. IV - 15 Norma Munguia, Percy Aitken, Abdul Wahab, Irving Johnson, "Salt Extraction by Solar Energy", A Mini-project, September 1980

No. IV - 16 Abdul H. Wahab, Percy Aitken-Soux, Irving E. Johnson and Howard Murray, "The Allsides Project in Jamaica - Developmental Potentials of Hillside Agriculture", September 1980

No. IV - 17 P. Aitken, A. Wahab, I. Johnson, A. Sahney and N. Munguia, "Rural Women Survey", Vols. I, II and III, October 1980

No. IV - 18 P. Aitken, I. E. Johnson, A. Wahab, "Assessment of Employment Among Small Hillside Farmers of Jamaica", November 1980

No. IV - 19 IICA/Jamaica "Pilot Hillside Agricultural Project", (PHILAGRIP), Final Project Document. October 1980.

No. IV - 20 P. Aitken, A. Wahab, I. E. Johnson, Bo-Myeong Woo, "IICA Evaluation of the First Phase FSB Allsides Project", (Internal Document of Work), November 1980

No. IV - 21 MINAC/IICA/CARDI - "Seminar on Multiple Cropping", December 1980

1981

No. V - 1 N. Munguia, P. Aitken, A. Wahab, I. Johnson, "Smoke Curing of Fish (as a household industry in Rural Jamaica)", January 1981

No. V - 2 P. Aitken, A. Wahab, I. Johnson, "Under-employment - It's Relation to the Agricultural Sector and Considerations for its Management", January 1981

No. V - 3 D. D. Henry, J. R. Gayle, "The Culture of Grafted Pimento (as spice crop for Allsides, Jamaica)", January 1981

No. V - 4 Abdul H. Wahab, Noel Singh, "Agricultural Research in Jamaica", February 1981

No. V - 5 P. Aitken-Soux, A. H. Wahab, I. E. Johnson, "Country Level Action Plan (CLAP)", May 1981

No. V - 6 P. Aitken-Soux, A. H. Wahab, I. E. Johnson, "Overview of Agricultural Development in Jamaica", May 1981

No. V - 7 Samuel Thompson, I. E. Johnson, P. Aitken-Soux, Abdul Wahab, "The Land Development & Utilization Act 1966", July 1981

No. V - 8 Abdul Wahab, Percy Aitken-Soux, Irving Johnson, Bo-Myeong Woo, Howard Murray, Joseph Dehaney, "The Experiences of Jamaica in the Management of Agricultural Production on Hillsides", July 1981

No. V - 9 Dave Hutton, Abdul Wahab, Howard Murray, "Yield Response of Yellow Yam (Dioscorea Cayenensis) After Disinfesting Planting Material of Pratylenchus Coffeae", July 1981

No. V - 10 Elaine Montague-Gordon, Abdul H. Wahab, Joseph Dehaney and Audrey Wright, "Performance of Eleven Varieties of Dry Beans (Phaseolus vulgaris) Over Two Successive Seasons on the Hillsides of Jamaica", August 1981

No. V - 11 Dave G. Hutton, Abdul H. Wahab, "Position Paper on Root Crops in Jamaica", August 1981

No. V - 12 Percy Aitken-Soux, Abdul H. Wahab, Irving E. Johnson, "Technical Assistance for the English Speaking Caribbean (Considerations for an IICA Strategy)" (Internal Document of Work), September 1981

No. V - 13 Bo-Myeong Woo, Abdul H. Wahab, Joseph Dehaney, "Crop Production on Hillsides using non-Bench Terracing Alternative Measures for Soil Conservation (first year's results of the Clive River Soil Conservation studies)", September 1981

No. V - 14 Abdul H. Wahab, Percy Aitken-Soux, Irving E. Johnson, Bo-Myeong Woo, Howard Murray and Joseph Dehaney, "Agricultural Production on Hillsides - the Allsides Project Case Study", September 1981

No. V - 15 D. G. Hutton, A. H. Wahab and J. Dehaney, "Investigating Critical Levels of Dry Rotting of Yellow Yam (Dioscorea Cayenensis) Planting Material, the Benefits of Disinfesting the Heads of Pratylenchus Coffeae and of After-Planting Nematicide Treatments", September 1981

No. V - 16 D. G. Hutton, A. H. Wahab, H. Murray and J. Dehaney, "Critical Levels of Dry Rotting of Yellow Yam (Dioscorea Cayenensis) Planting Material and Yield Responses After Disinfesting Heads of Pratylenchus Coffeae and After Post-Plant Nematicide Applications", September 1981

No. V - 17 E. Ayer and J. Reyes, "Seminar on Mediterranean Fruit Fly", September 30, 1981

No. V - 18 Bo-Myeong Woo, "Erosion Control Works in Korea", October 1981

No. V - 19 Irving E. Johnson and Percy Aitken-Soux, "Country Level Action Plan (CLAP) (Third Revision - Internal Document of Work), October 1981

NO. V - 20 Humberto Pizarro, "Programme of Work to Establish Guidelines for the Effective Administration, Operation and Maintenance of the Irrigation and Drainage District in the BRUMDEC Project" November 1981

No. V - 21 Humberto Pizarro, "The Operation of the Drainage System in the Black River Upper Morass Project", November 1981

No. V - 22 Humberto Pizarro, "Recommendations for Land Use and Irrigation Needs in the BRUMDEC Project", November 1981

No. V - 23 Humberto Pizarro, "Organization, Operations and Maintenance of the Irrigation System in the BRUMDEC Project", November 1981

No. V - 24 Humberto Pizarro, "Basic Infromation for Planning Water Management in the BRUMDEC Project", November 1981

1982

No. VI - 1 Vivian Chin, "Rice Research and Production in the BRUMDEC Project State-of-the-Art Review, Identification of Constraints and Interim Recommendations and Budget for Establishing 405 Hectares (1,000 acres) of Rice on the Clay Soils at BRUMDEC", January 1982

No. VI - 2 Vivian Chin, "Programme of Work for the Short-Term Adaptive Production Oriented Research on Rice in the BRUMDEC Project", January 1982

No. VI - 1 Vivian Chin, "Rice Research and Production in the BRUMDEC Project State-of-the-Art Review, Identification of Constraints and Interim Recommendations and Budget for Establishing 405 Hectares (1,000 Acres) of Rice on the Clay Soils at BRUMDEC", January 1982

No. VI - 2 Vivian Chin, "Programme of Work for the Short-Term Adaptive Production Oriented Research on Rice in the BRUMDEC Project", January 1982

No. VI - 3 Claude Grand-Pierre, "Adaptive Research for Grain Production (BRUMDEC) - (A Short Term Programme)", January 1982

No. VI - 4 Claude Grand-Pierre, "Experimental Procedures for Grain Crops Research on the BRUMDEC Project", January 1982

FECHA DE DEVOLUCION			

Autor

Título EXPERIMENTAL PROCEDURES FOR GRAIN CROPS RESEARCH ON THE BRUMDEC PROJECT

Fecha Devolución	Nombre del solicitante