

Operation Plan  
of 50 ha Pilot Farm  
in Abu Gasaba Rice Project  
in 1979

( Draft )

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## 1. Preface

The 50 ha Pilot Farm of the Gasaba Rice Development Project is to be commenced this year. The actual construction work will be completed within June, 1979.

For this Pilot Farm Operation, we are required to establish the detailed schedule.

Unfortunately, there lies several restricting conditions for our Pilot Farm Operation this year, and we are obliged to arrange our schedule according to those conditions. Those are discussed in next chapter.

## 2. Some Explanation of The Situation

- 1) By statistics of water level of White Nile River, the day which water reach the second pump station lies between 5th to 10th of August. The first pump station which can convey water to the second pump station will be facilitated on the second phase construction work.

Accordingly, the plantation of 50 ha Pilot Farm will start on 10th, August.

- 2) The plots in Pilot Farm will not be completely flat on account of the first year after opening the land. After several puddlings, it may be sure to become flat tolerably for direct sowing cultivation method which is of course, of full mechanized farming system.

### 3. Plan of Farm Operation

#### 1) Experimental Study

Many experimental studies must be done for future rice cultivation. Rice is rather new crop in this area that we must find out many things and establish cultivation pattern urgently.

Those items are as follows :

- a. Selection of varieties which is suitable for main or offseasonal cultivation under mechanized farming.
- b. Establishment of the cropping pattern in combination of those varieties.
- c. Find out the most effective weeding pattern.
- d. Find out the optimum amount and suitable timing of fertilizer application for rice in this Abu Gasaba Basin.
- e. Establishment of the most actual systematic mechanized farming operation.
- f. Find out the actual water requirement in big farming.
- g. Find harmful insects and pests which seems to prevail in future in this area, and find out the countermeasures for those pests.

On this coming main season which start from June, we are to practice main seasonal experiment. It should be practiced in The Pilot Farm actually, but water won't reach to The Pilot Farm until the beginning of August. In August, we are afraid that we must be concentrating on trial cultivation and have less time

to practice that experiment until the middle of September. And September planting cannot be a main-seasonal experiment.

We have no other choice but practicing the main seasonal experiment in 2 ha experimental farm in Ed-Duein. Thus we are to convince the Agricultural Cooperation to lend that land until the end of December when our main seasonal experiment finish.

## 2) Trial Cultivation

There are several possibilities for this trial cultivation. We should discuss those matters case by case.

The area for this trial cultivation is 40.05 ha which is 89 plots ( East plot area is 0.45 ha ) and other five plots for seed multiplication, one plot for seasonal planting test plot. The rest of the pilot farm, 7.25 ha, are for mechanization practice and trial field.

Direct Sowing Method is not applied first year, as discussed previous chapter, so as to get the maximum amount of seeds for future cultivation. The virgin land tend not to be so flat that that method is not recommendable in this chapter.

Case 1      If 8000 pieces of seedpots for broadcast  
             transplanting could be gotten:

A -- 50 plots for broadcast transplanting  
    -- 40 plots for ordinary transplanting

No. of laborers

- ( 1 ) 40 .....11th, Aug. to 23rd, Aug.
- ( 2 ) 30 .....28th, Aug. to 13th, Sep.
- ( 3 ) 15 .....15th, Sep to 20th, Sep.
- ( 4 ) 65 .....22nd, Sep. to 18th, Oct.

The detailed schedule is shown in Fig. 1 --Case 1-A.

The contents of No. of laborers in period (1) to (4) are  
as follows:

Period (1) ..... Main field is 22.5 ha for Broadcast  
Transplanting. 8000 pieces of seedpots should be ready  
and placed in seedbed within 12 days from 11th, Aug. to  
23rd, Aug. 670 seedpots per one day. The maximum plot  
area for this seedpot is  $7.2 \text{ m}^2$  with  $1.2 \text{ m} \times 6 \text{ m}$  where  
40 seedpots can be layed on. The critical difference of  
water level in one plot is 3 cm. Each plot must be  
independent by the meaning of water supplyment.  
Thus, 17 such like plots are required to be prepared in  
one day. Usually, 20 laborers will do, but 30 laborers  
are needed on account of Ramadan activities.

Then, to prepare 670 pots per one day, 8 laborers are needed. Plus two for transfer those seedpots.

It makes 40 laborers all in all.

Period (2) ..... The preparation of seedbed of Seed Multiplication in 3 days from 28th to 30th require 25 laborers. Sowing the seeds of 10 varieties require five laborers. 30 laborers all in all are needed in this period, and they may continue preparing the seedbed for 40 plots ( 18.2 ha ) of trial cultivation by ordinary transplanting. In between those seedbed preparations, they may transplant the broadcastable seedlings of seedpot.

This period is 17 days from 28th, Aug. to 13th, Sep.

Period (3) ..... Replanting and repairing the dyke require 15 laborers.

This period starts from 15th, Sep. to 20th, Sep.

Period (4) ..... This period need much laborers for uprooting seedlings and transplanting. The required speed for those works is 15 plots ( 6.75 ha ) per 6 days. ( = 1.125 ha / day ) The actual transplanting speed by Kohchi Method, which is faster way of transplanting, is  $500 \text{ m}^2 / \text{m.d.}$  Accordingly, 25 laborers are needed approximately for transplanting.

If we use the area of one twenty-fifth of main field for seedbed, we must uproot seedling from  $450 \text{ m}^2$  of seedbed in one day. The actual speed for it is  $2 \text{ m}^2/\text{m.h.}$  ( = or  $12 \text{ m}^2/\text{m.d.}$  ) Accordingly, 37.5 laborers are required for this work.

Three laborers are needed for transport the seedling.

It makes 65 laborers each day starting 22nd, Sep. to 18th, Oct.

#### Case 1 - B

-- 50 plots for broadcast transplanting

-- 40 plots for Dapog Method

#### No. of laborers

(1) 5 .....28th, July to 9th, Aug.

(2) 35 .....11th, Aug. to 23rd, Aug.

(3) 40 .....28th, Aug. to 13th, Sep.

(4) 15 .....15th, Sep to 2nd, Oct.

The detailed schedule is shown in Fig. 1 -Case-B.

The contents of No. of laborers in periods (1) to (4) are as follows:

Period (1) ..... Dapog Method is a special method of raising seedling of Phillipines. Usually, seed is sown on banana leaves thickly, but here, seed is sown on the flat concrete place instead of banana leaves. Using this method, not much water is required for raising seedling. Roughly, one 4 ton water tanker is enough for one day. Thus, we can sow the seed on 28th, July. Using 14 day-old seedling, transplanting can be started on



11th, Aug.

Five laborers are needed to prepare seed and sprinkle water to seedbed.

Period (2) .....Transplanting for 40 plots ( 18.2 ha ) in 12 days means around 1.5 ha in one day. With the transplanting speed mentioned before, 30 laborers are required.

Other five laborers will work on preparing the seedbed for seed multiplication, sowing on it, and preparation of seedbed of broadcast transplanting.

Period (3) ..... Up to 9th, Sep. seedbeds and seedpots of broadcast transplanting must be prepared.

No. of laborer are 40, as explained in Case 1-A.

Period (4) ..... Transplanting of broadcastable seedling and replanting of Dapog Method require 15 laborers.

Case 2      If no seedpot for broadcast transplanting could be gotten:

A -- 90 plots for ordinary transplanting

No. of laborers

(1) 10 ..... 11th, Aug. to 3rd, Sep.

(2) 55 ..... 4th, Sep to 25th, Oct.

The detailed schedule is shown in Fig. II -- Case 2-A.

The contents of No. of laborers in period (1) and (2) are as follows :

Period (1) ..... Preparation of seedbed and sowing seed require 10 laborers. The style of seedbed might be primitive one which tractor will do most of the work.

Period (2) ..... There are 95 plots ( 42.75 ha ) to be transplanted including seed multiplication plots.

If we must finish transplanting within October with minimum No. of laborer, around 44 days are for it.

Accordingly, 0.98 ha must be transplanted everyday.

20 laborers are required for it. 400 m<sup>2</sup> of seedbed must be uprooted in one day. 33 laborers for to transport the seedlings.

55 laborers are needed in this period.

Case 2-B -- 40 plots for Dapog Method

-- 50 plots for ordinary transplanting

No. of laborers

- (1) 5 ..... 28th, July to 9th, Aug.
- (2) 35 ..... 11th, Aug. to 23rd, Aug.
- (3) 10 ..... 28th, Aug. to 3rd, Sep.
- (4) 55 ..... 4th, Sep. to 6th, Oct.

The detailed schedule is shown in Fig. II -Case 2-B.

The contents of No. of laborers in Period (1) to (4) are as follows :

Period (1) ..... As stated in Case 1-B, five laborers are needed to prepare seed and sprinkle water to seedbed.

Period (2) ..... This is also explained in Case 1-B. 30 laborers for transplanting, 5 for seed multiplication.

Period (3) ..... For the preparation of seedbed for ordinary transplanting and maintenance of dyke and canal, 10 laborers are needed.

Period (4) ..... If we finish transplanting with the same speed which is mentioned in Period (2), Case 2-A, 55 laborers are needed all in all as same as Case 2-A.

Case 2 - C 90 plots for Dapog Method

No. of laborers

- (1) 5 ..... 28th, July to 9th, Aug.
- (2) 30 ..... 11th, Aug. to 16th, Aug.
- (3) 35 ..... 18th, Aug. to 20th, Aug.
- (4) 30 ..... 21st, Aug. to 20th, Sep.

The detailed schedule is shown in Fig.III, Case 2-C.

The contents of No. of laborers are as follows :

Period (1) ..... As stated in Case 1-B, five laborers are needed to prepare seed and sprinkle water to seedbed.

Period (2) ..... This is also explained in Case 1-B. 30 laborers for transplanting.

Period (3) ..... The transplanting may be continuing with 30 laborers, while other five will prepare the seedbed for seed multiplication.

Period (4) ..... This is same procedure of Period (2).

For transplanting of seed multiplication, 35 laborers will try for it and may complete it within a week starting from 15th, Sep. up to 20th, Sep.

Fig. IV Comparison of each case

	No. of laborers <sup>∠ 1</sup>	<sup>∠ 2</sup>	Special Materials to be needed	Seed Amount <sup>∠ 3</sup>
Case 1-A	2,590	10th, Sep.	8,000 pieces <sup>c</sup> of seedpot	1,100 kg
Case 1-B	1,355	6th, Sep.	same as above	2,000 kg
Case 2-A	2,665	22nd, Sep		1,200 kg
Case 2-B	2,060	30th, Aug.		2,000 kg
Case 2-C	1,185	29th, Aug.		2,500 kg

∠ 1 Total No. of laborer untill finishing transplanting.

Expressed by man.date.

∠ 2 This is the day when we can finish sowing seed.

∠ 3 Trial Cultivation only.

### 3) Seed Multiplication

Ten advantageous varieties are to be multiplied for coming crops. For select out those varieties, next items are considered :

- (1) Productivity
- (2) Milling Quality
- (3) Market Value
- (4) Maturity Term

Varieties are not fixed yet, and varietal test and renewing of seeds must be done on parallel to this seed multiplication. Five plots are used, and each variety is sown in half a plot. The area for each variety is approximately 0.2 ha. The target yield for each variety is one ton from this area ( 5 ton/ha )

The varieties are as follows :

IR-5, IR-8, IR-24, Tos 103, C-11, C-15, BG-34, BG-90, IR-298

### 4) Training of Staffs, Operators and Assistants

Although rice has been planted since ancient time in Asia, it is rather new crop here in Sudan. Accordingly, the government staffs have had less opportunity to see the actual rice cultivation, neither tractor operator nor worker.

Although they have no good instructor at present,

they may study through their daily activities. Also, staffs will have a study meeting every weekend with the help of Japanese Expert.

In fact, this study may be more important than to get more yield at first stage.

#### 4. Materials to be needed

##### 1) Fertilizer

Urea .....20 t

Triple Super Phosphate .....10 t

##### 2) Insecticide and Fungicide

Smithion .....150 liters

Some Fungicide ..... 50 liters

##### 3) Herbicide

Basagran ( or Propanil ) .....200 liters

Swep M ( or X-52 ) ..... 2 t

##### 4) Fuels

Light Oil .....25,000 liters

Petrol ..... 1,000 liters

##### Lubricant

\* No.30 oil for petrol engine...200 liters

\* No.30 oil for light oil engine...1,250 liters

\* No. 90 oil .....1,000 liters

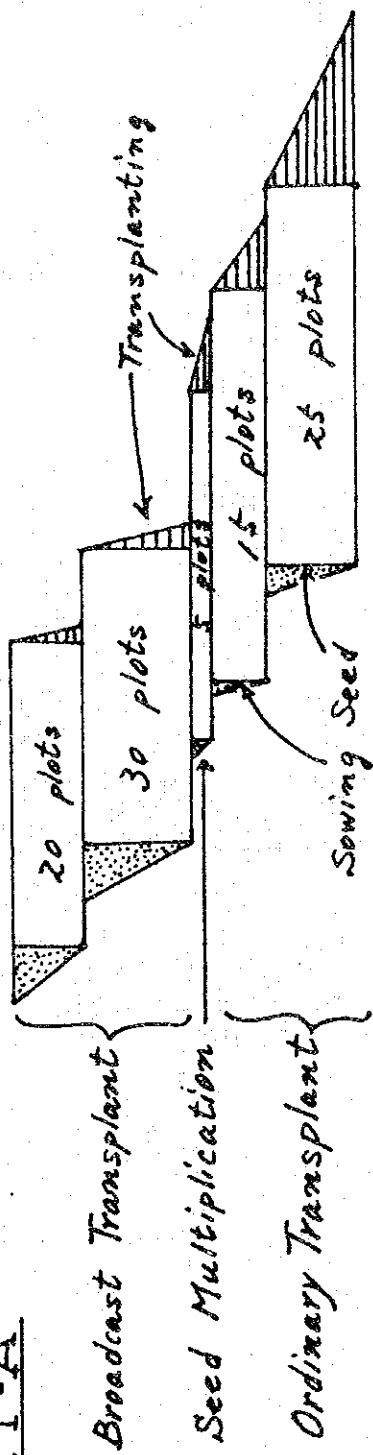
FIG. I

July August September October



Irrigation Water

Case I-A



Case I-B

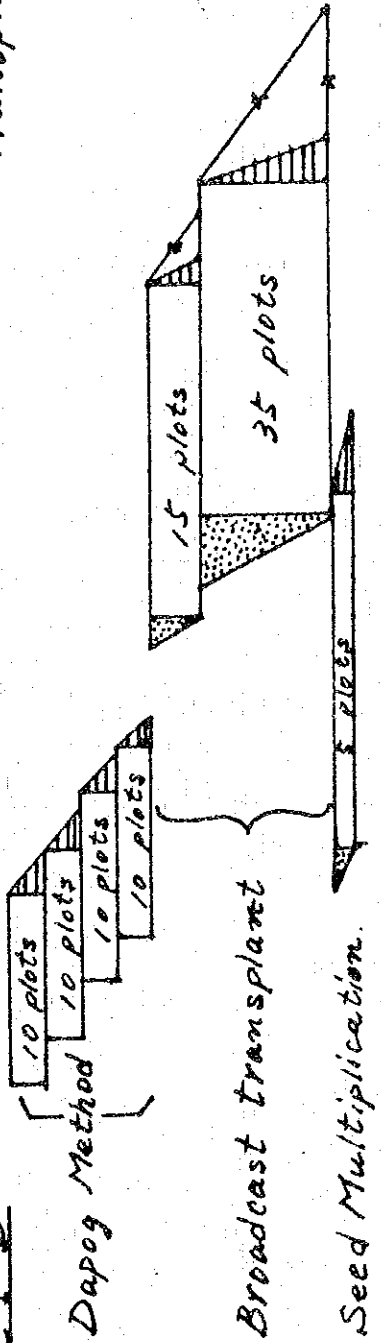
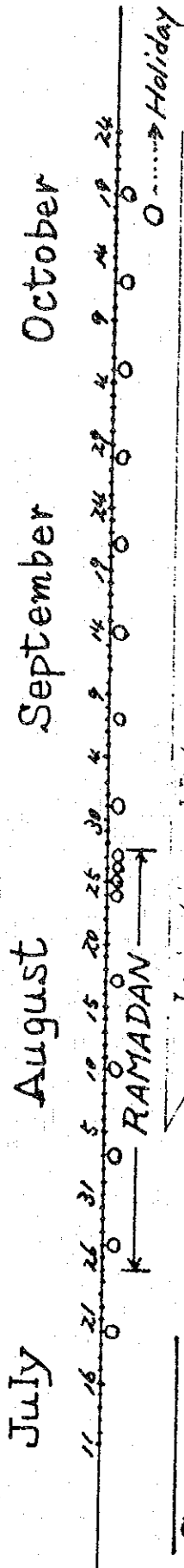
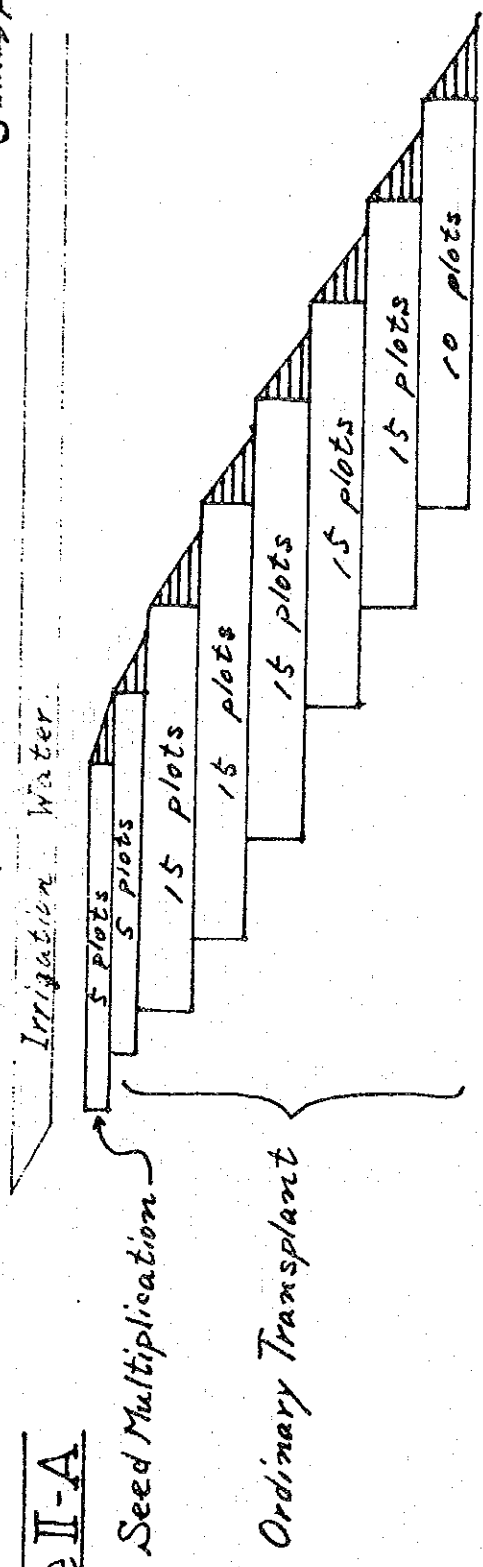




FIG. II



Case II-A



Case I-B

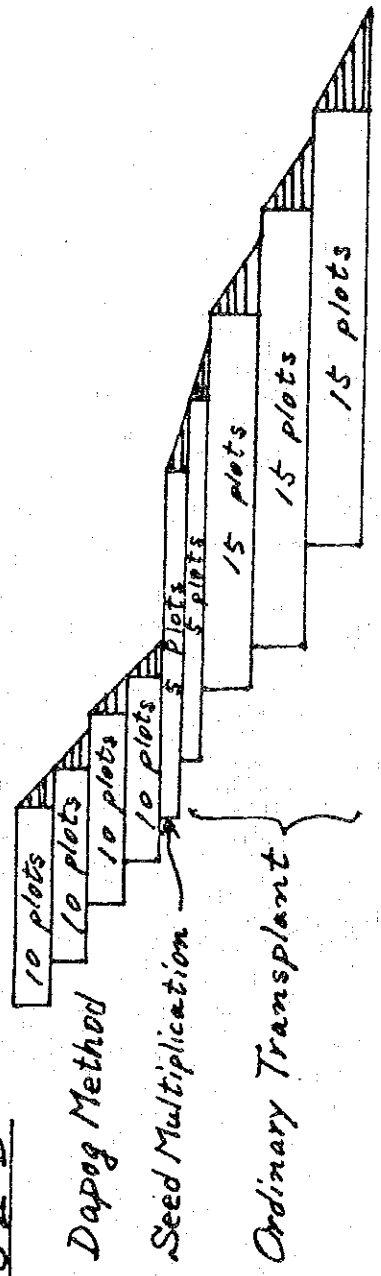
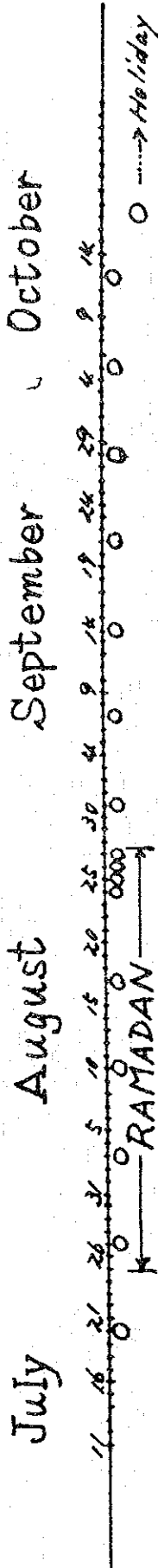
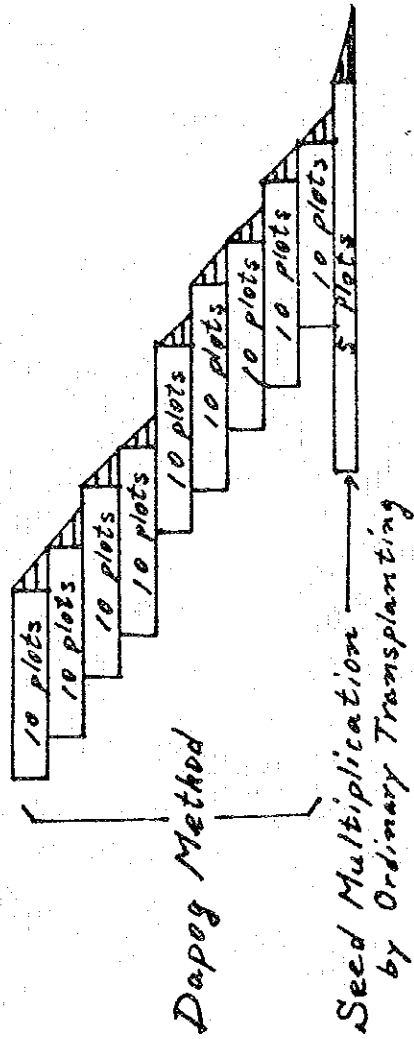


FIG. III



Case II-C



XI. Result of The Pilot Farm Operation in 1979



Tab.XI-1 Result of sampling

Treat- ment	Rep. No.	Sowing Date	Heading Date	Maturity Date	Weight of full-filled of hill	No. of hill per m <sup>2</sup>	No. of Grain per m <sup>2</sup>	No. of Grain per Panicle	1000 Grain Weight (g)	Percent- age of Grain ripened (%)	Percent- age of unferti- lized Grain	Yield (t/ha)
B-14	1	18/8	18/11	20/12	16.2	30	39800	18.5	65.9	14.4	4.9	
	2	"	"	"	9.2	35	24700	19.5	66.6	16.4	3.2	
	3	"	"	"	11.3	31	28800	20.5	61.1	22.5	3.5	
	4	"	"	"	22.7	25	45300	19.3	64.8	15.1	5.7	
	5	"	"	"	24.8	25	36300	19.5	87.4	5.7	6.2	
B-15	1	"	"	"	7.1	34	11600	18.3	56.1	23.1	2.4	
	2	"	"	"	12.7	37	36000	18.3	71.1	14.4	4.7	
	3	"	"	"	14.5	29	31100	18.5	55.3	21.9	4.2	

(Depog Method)

No. of No. of Hill Panicle per per Hill m<sup>2</sup>

B-17	1	18/8	12/11	5/12	28	14.0	392	18900	48.1	19.8	83.8	6.9	3.1
	2	"	"	"	33	21.7	528	23200	43.9	21.4	84.7	9.1	4.2
	3	"	"	"	16	46.7	747	35600	47.6	20.5	72.1	15.6	5.3
B-18	1	"	8/11	4/12	21	19.4	407	23100	56.7	20.3	59.8	27.6	2.8
	2	"	"	"	24.3	21.8	530	34400	64.9	20.4	72.0	20.5	5.1
	3	"	"	"	25.3	21.5	544	40500	74.4	20.8	62.0	27.3	5.2
	4	"	"	"	22.7	16.5	375	20800	55.6	20.6	72.8	11.3	3.1
	5	"	"	"	12.3	25.9	552	35500	64.3	20.8	47.6	28.2	3.5

( Direct Seeding method )

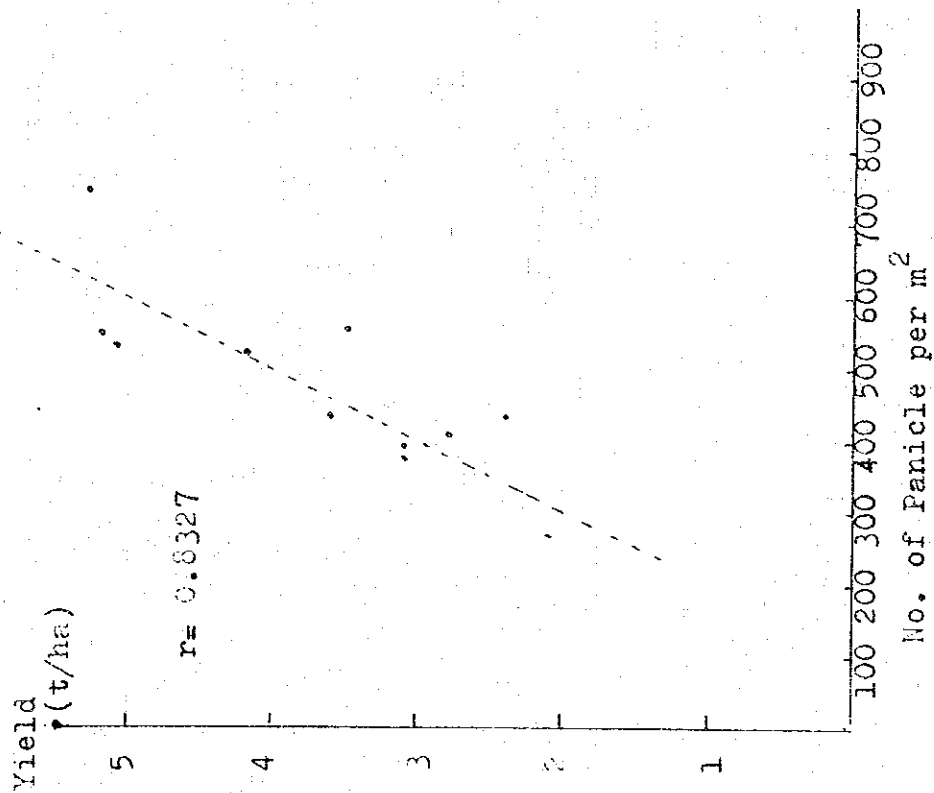
B-04	1	20/8	11/12	2/1	39.1	434	28400	65.4	15.5	83.0	10.2	3.6
	2	21/8	11/12	2/1	39.0	433	22100	51.1	15.0	73.0	18.9	2.4
	3	21/8	12/12	2/1	24.4	271	17500	64.6	15.7	70.4	14.9	2.1

Reference... Varieties of Dapog method and direct seeding are C-11 and IR-20, respectively.

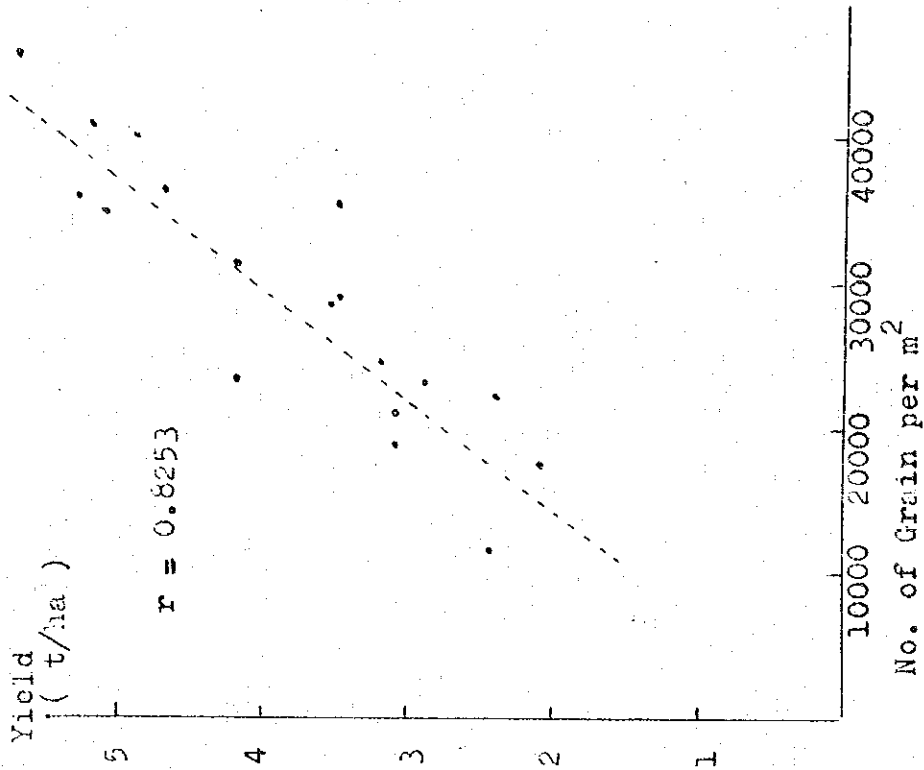
FIG. XI-1

Coefficient Correlation

1. Yield and No. of Panicle per m<sup>2</sup>



2. Yield and No. of Grain per m<sup>2</sup>









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