

学 名	インドネシア名	学 名	和 名
padi gogo (陸 稲)	hama lundi	<u>Halotrichia holler</u>	
	walang sangit	<u>Leptocorixa acuta</u>	タイワソクモヘリカメムシ
petsai (白 菜)	perusak daun	<u>Grocidolomia binotalis</u>	(ノメイガ科)
		<u>Plutella xylostella</u>	(コナガの属)
	hama Aphis	<u>Myzus persicae</u>	モモアカアブラムシ
pisang (バナナ)	ulat penggulung daun	<u>Erionata thrax</u>	
sawi putih (白 菜)	perusak daun	<u>Grocidolomia binotalis</u>	(ノメイガ科)
		<u>Plutella xylostella</u>	(コナガの属)
teh (茶)	punggulung daun dan pucuk	<u>Caloptilia theivora</u>	
		<u>Enarmonia leucostoma</u>	(ヒメハマギガ科)
	pengisap daun	<u>Homona coffearia</u>	チャハマキ
		<u>Helopeltis sp.</u>	(メクラカメムシ科)
	ulat jengkal	<u>Hyposidra talaca</u>	
	hama tangan jingga	<u>Brevipalpus phoenicis</u>	
tebu (サトウキビ)	penggerek batang	<u>Chillo sacchariphagus</u>	(メイガ科)
		<u>Diatraea saccharalis</u>	(ツトガ科)
	penggerek pucuk	<u>Scirphophaga niveola</u>	
	pengisap daun	<u>Perkinsiella saccharicida</u>	
		<u>Stibaropus molginus</u>	
	hama lundi		

作物名	インドネシア名	学名	和名
tembakau (タバコ)	perusak daun	<u>Plusia chalcites</u>	(ウワバの類)
		<u>Prodenia litura</u>	ハスモンヨトウ
	ulat tanah	<u>Agrotis sp.</u>	ネキリムシ
tomat (トマト)	penggerek pucuk	<u>Heliothis sp.</u>	オオタバコガ等
		<u>Heliothis spp.</u>	(オオタバコガ等)
	ulat tanah	<u>Agrotis spp.</u>	ネキリムシ

報告3. インドネシア農薬登録リスト(1979)所載

対象病害名

作物名	学名	インドネシア名	英名	和名
イネ	<u>Cercospora oryzae</u>	penyakit becak daun	Cercospora leaf spot, narrow brown spot, glume spot	すじ葉枯病
	<u>Piricularia oryzae</u> (= <u>Pyricularia oryzae</u>)	P. busuk leher	blast, (neck blast)	いもち病 (首いもち)
トウモロコシ	<u>Sclerospora maydis</u>	P. bulai	downy mildew	べと病
落花生	<u>Cercospora arachidicola</u> = <u>Mycosphaerella arachidicola</u>	P. becak daun	brown leaf spot, leaf spot	褐斑病
	<u>Cercospora personata</u> = <u>Mycosphaerella berkleyii</u>	P. becak daun	leaf spot, blak spot	黒渋病
緑豆	<u>Elsinoe iwatae</u>	P. kudis	scab	そう痂病
タバコ	<u>Cercospora nicotinae</u>	P. patik daun	frog-eye leaf spot	白星病
	<u>Phytophthora parasitica</u> var. <u>nicotianae</u>	P. patah rebah	black shank, brown spot	疫病
	<u>Pythium</u> spp.	P. patah rebah	Damping off, bed rot	舞病 立枯病
	<u>Rhizoctonia solan</u> <u>depesmaian</u>	P. patah rebah	Rhizoctonia disease sore shin	腰折病 立枯病

作物名	学名	インドネシア名	英名	和名
茶	<u>Exobasidium</u> <u>vexans</u>	P. cacar daun	bister blight	もち病
サトウキビ	<u>Cercospora</u> <u>koepkei</u>	P. noda kuning	brown spot, yellow leaf spot, yellow spot	葉片 赤斑病
コーヒー	<u>Hemileia</u> <u>vastatrix</u>	P. karat daun	rust, orange rust, leaf disease	(葉さび病)
チョコレート	<u>Phytophthora</u> <u>palmivora</u>	P. busuk buah	dry rot	
ロゼラ	<u>Phytophthora</u> <u>parasitica</u>	P. busuk kaki	black foot rot	
コショウ	<u>Phytophthora</u> <u>mivora var. piperis</u>	P. busuk kaki	foot rot	
キナ	<u>Rhizoctonia solani</u>	P. mopog	Damping off	
バニラ	<u>Nectria vanillae</u>	P. batang	Stem rot	
丁字	<u>Cylindricadium</u> <u>aiqueseptatum</u>	P. becak daun	leaf rot	
パラゴム	<u>Ceratocystis</u> <u>fimbriata</u>	P. bidang sadapan	(mouldy rot)	
ココヤシ	<u>Fusarium sp.</u>	P. becak daun	banded lesion	
	<u>Gloeosporium sp.</u>	P. becak daun	Gloeosporium leaf spot	
	<u>Helminthosporium sp.</u>	P. becak daun	Helminthosporium leaf spot	

作物名	学名	インドネシア名	英名	和名
馬鈴薯	<u>Pestalotia</u> sp. (<u>Pestaloggia</u> sp.)	P. becak daun	Pestalotia leaf spot	
	<u>Fusarium</u> sp.	P. busuk ubi	dry rot	
	<u>Phytophthora</u> <u>infestans</u>	P. busuk daun	late blight, downy mildew, potato blight	疫病
トマト	<u>Fusarium</u> spp.	P. layu	Fusarium wilt	
	<u>Phytophthora</u> <u>infestans</u>	P. busuk daun	late blight	疫病
白菜	<u>Alternaria</u> <u>brassicae</u>	P. becak daun	gray leaf spot, Alternaria leaf spot	黒斑病
ネギ	<u>Alternaria</u> <u>alii</u>	P. becak ungu	Alternaria leaf spot	
	<u>Personospora</u> <u>destructor</u>	P. jamur	downy mildew	べと病
赤タマネギ	<u>Personospora</u> <u>destructor</u>	P. jamur	downy mildew	べと病
トウガラシ	<u>Cercospora</u> spp.	P. daun	Cercospora leaf spot	
	<u>Colletotrichum</u> <u>capsii</u>	P. antraknose	Anthracnose	炭そ病
柑 橘	<u>Oidium</u> <u>tingitanium</u>	P. tepung	powdery mildew	うどんこ病
リンゴ	<u>Dothiorella</u> sp.	P. kanker	stem cancer	

報告 4. 中ラソボン県におけるトビイロウンカの現状

To : Ir. Kusnadi Affandi Inspector, DIPERTA Propinsi Lampung.

From : Dr. O. MOCHIDA (LP₃ - IRRI) and Mr. Y. UEDA (JICA, Tani Makmur Project, Lampung).

Subject: The present situation of the brown plant-hopper in Central Lampung.

Date : 6 April, 1979.

Dear : Ir. Kusnadi Affandi,

Today we visited 8 sites at 3 locations in central Lampung, Location nos. 1 - 4 in Hadimulyo (Metro), 5 - 7 in Dono Arum (Terbanggi Besar), and 8 in Nambah Dadi (Ibid.). Detailed data on our short trip are given in Table 1. We are pleased to report briefly to you as follows:

Lowland rice

In Hadimulyo, we found the hopperburn (Puso) on both Pelita I-1 and PB₅, whereas no hopperburn was seen on PB₂₆. The population density of the brown planthopper (BPH, total no. of adults and nymphs/hill) was 0.3 - 22.5 on PB₂₆ (Loc.nos. 1 - 3) and 13.6 on Pelita I-1 (Loc. no. 4). We observed the highest population was 74 on a hill of PB₂₆ field, where is located next to a hopperburn field of Pelita I-1.

In Dono Arum, we found hopperburn on Pelita I-1. The population density was 690.9 (Loc. no. 7). We tried but could not find any PB₂₆ field there.

In Nambah Dadi, we found hopperburn on Pelita I-1 and infestation on PB₂₆ located nearby hopperburn fields of Pelita. The population was 4.3 on PB₂₆.

In these 3 locations, we found sometimes slightly higher populations of 25 - 50/hill on PB₂₆. But such PB₂₆ fields are located next or nearby the hopperburn fields of Pelita I-1. The relative frequency of the hills of rice plants showing virus diseases was 0.0 for grassy stunt (GS) and 0.0 - 3.7 % for ragged stunt (RS).

Upland rice

We observed on Upland rice only in Dono Arum. We found infestation of BPH on local varieties but could not find hopperburn. We could not judge the intensity of infestation because of being too late for observation in many fields.

The population density was 54.5/hill on Betitung and 8.2 on Ketan Laler.

As Upland rice is cropped once a year, we guess that the original generation of BPH on Upland rice came from Lowland rice fields or sawah. We found a hopperburn field of Pelita I-1 in sawah, located about 1 km apart from the Upland rice area. The frequency of virus diseases was 0.0 for GS and 0.0 - 0.9 % for RS.

Conclusions and comments

Lowland rice

- 1) We don't think that biotype 2 has appeared at 3 locations in Central Lampung now as far as we observed.
- 2) As BPH can move from hopperburn fields of Pelita I-1, PB5, and C4-63 into PB26 fields, and farmers crop Pelita I-1 and PB26 next to next in small pieces of sawah, especially in Nambah-Dadi, recommend farmers to crop PB26 instead of Pelita I-1 and PB5.
- 3) Apply insecticides in correct ways wherever and whenever BPH will be found.
- 4) As soon as possible after harvest by ani2, cut rice plants nearby the soil surface by sickles and burn or put them into the soil.

Upland rice

- 5) We confirmed that Upland rice is attacked in Dono Arum by BPH and maybe including RS. Be careful of BPH in early stages of rice development and in Upland rice area located nearby sawah.

ACKNOWLEDGEMENTS

We wish to express our hearty thanks to Ir. Kusnadi Affandi his staff, Ir. Yusfian Yusuf, Mr. Abdullah Lawi, Mr. Sofyan, and Mr. M. Nodah (JICA expert) for their help during our survey trip. They also acknowledge Ir. Soehendi Machdali, Ir. Hanan Zaed, Dr. T. Nishizawa, and Mr. F. Daimaru for their comments and helps in various ways.

TABLE 1: FIELD SURVEY DATA ON BPH IN LAMPUNG IN THE EARLY OF APRIL 1979.

Location No.	Location	Date (1979)	Cultivar	Stage of rice plants	BPH		WBPH		GLH		% hills of rice plants with symptoms			Rice cropping /yr
					No. adults + nymphs		No. adults + nymphs		No. adults + nymphs		GS	RS	TG	
					/hill	/50 strokes of sweeping	/hill	/50 strokes of sweeping	/hill	/50 strokes of sweeping				
1/	2/	3/	4/	5/	6/									
AM 1.	Hadimulyo, - " - Lam. Tengah	6 April	PB.26	Maturity	a. 5.1 n. 17.4 T. 22.5	-	0.0	-	0.0	-	0.0	0.0	-	2
2.	- " -	"	"	"	a. 0.9 n. 0.6 T. 1.5	-	0.0	-	0.0	-	0.0	0.0	-	2
3.	- " -	"	"	"	a. 0.2 n. 0.1 T. 0.3	-	0.0	-	0.0	-	0.0	0.0	-	2
4.	- " -	"	Pelita I-1	"	a. 3.9 n. 9.7 T. 13.6	-	0.0	-	0.0	-	0.0	0.0	-	2
5.	Dono Arum - " - Terbanggi Besar Lampung Tengah	"	Belitung (Local, upland)	"	a. 2.0 n. 52.5 T. 54.5	-	0.0	-	0.0	-	0.0	0.0	-	1 (Upland)
6.	- " -	"	Ketan Laler (Local Upland)	"	a. 0.4 n. 7.8 T. 8.2	-	0.0	-	0.0	-	0.0	0.0	-	1 (Upland)
7.	- " -	"	Pelita I-1	"	a. 392.0 n. 298.9 T. 690.9	-	0.0	-	0.0	-	0.0	3.7	-	2
8.	Nambah Dadi - " - Terbanggi Besar Lampung Tengah	"	PB.26	"	a. 0.6 n. 3.7 T. 4.3	-	0.0	-	0.0	-	0.0	0.0	-	2

BPH, brown planthopper; WBPH, white backed planthopper; GLH, green leafhopper.

3) a, adults; n, nymphs; T. Total.

It is a very difficult and painstaking operation to resolve the rat problems in the Tropical Asia. Therefore we must make a great effort to decrease the damage of rats. We need to have a plentiful knowledge on a kind of rats and their habit here, and to use its knowledge for better controlling of rats.

We are afraid that we can not give a good practical advice on rat control, because we had not a plenty of time for observing rats here. But for the time being, some points to advise are as follows;

1. Early detection and early control

A control time was too late in every rats field where we observed.

It could be able to decrease the damage of rats, if early detection and early control was carried out. This is easy to speak, but difficult to carry out. We will make an effort to realize this problem by beating our brain.

1.i. Cleaning up fields and their circumstances

Clean up paddy fields and their circumstances, especially water canals and drainages where rats habit, and rats will be difficult to run into paddy fields. And farmers will be aware of their appearance early.

1.ii. Establishment of a reporting system

It is desirable to have many technical reports of rats or other pests early from the spot for early detection and early control.

For collecting these technical reports systematically, a reporting system should be established by using extension net works. On basing their report we can take an adequate measure for their outbreaks, and moreover, their reports will be useful forecasting of them in future.

1.iii. Keeping down rats population

It is very important to keep down rats population in paddy fields at all time. Before their population becoming high, we must control them a head.

2. Effective control methods

The control methods that we observed in the rat fields was (a) killing rats by farmers which run away from rat holes by smoking sulphur, and (b) putting baits including a rodenticide, zinc phosphate, on a footpath between paddy fields. Both methods are effective, but following items are to be added.

2.i. Poisonous baits

In the case of zinc phosphate application, it is necessary to try what kind of baits are eaten by rats favorably, when and where put on baits for a good eating.

2.ii. Use of bait box

It is effective to use a bait box, for example a bamboo tube, because zinc phosphate is soluble by rain.

2.iii. Use of rat trap

Rat trap is effective also. The rat trap made by farmer self be used in various area. It is available to find out an appearance of rats at earlier time by always setting rat trap.

2.iv. Killing by striking and so on

It is uneffective to use poisonous baits when there are many favorite baits for rats in fields, like a booting period rice plants. In the above case or in the case of no rodenticide, farmers must kill by striking rats.

And the cultivation method likely to be attacked concentrically, for example early cultivation of rice plant in only one field, should be avoided.

3. Desirable control system

As soon as rat control is done in one field, other rats will trespass from some neighboring fields. Then it is important that rats should be controlled at same time a cooperative works of farmers as a group.

It is effective to control rats with poisonoum baits when there are few favorite baits of rat in fields. Then it is expected to decrease greatly the damage from rats, if it is possible to get into the habit of controlling rats regularly in this period of every year.

Tegineneng, September 20 - 1978.

報告 6. トライアルの成績 解析

[A] 78/79 年度 農薬の濃度と散布量

[A]-1 SPRAYING DOSIS AND CONCENTRATION FOR
MAJOR INSECT PESTS ON LOWLAND RICE

Desa: Breja Indah

Kecamatan: Way Jepara

Design: Randomized block (3 blocks) (1 plot 6 x 4m)

Variety: IR 26 (hill space 23 x 23 cm)

Sowing time: June 5, 1979

Insecticide: Diazinon 60 EC

Spraying time: 5 times (15, 30, 45, 60 and 75 days after transplanting)

Results obtained are as follows:

treat- ment No.	spraying		rice stem borer	rice bug	yield
	concentration (cc/l)	dosis (l/Ha)	white head (%)	damaged (%)	(Kg/24 m ²)
1.	1	200	0.8	9.5	11.0
2.	1	300	0.7	10.4	11.8
3.	1	400	1.0	8.5	11.8
4.	1	500	0.3	10.7	11.7
5.	1	600	1.0	6.1	13.6
6.	2	200	0.4	8.3	13.0
7.	2	300	0.2	10.5	11.3
8.	2	400	0.6	7.5	12.5
9.	2	500	0.6	6.9	11.2
10.	2	600	0.5	11.8	12.5
11.	3	200	0.4	10.2	12.6
12.	3	300	0.3	11.4	11.4
13.	3	400	0.4	6.9	13.2
14.	3	500	0.3	9.2	12.8
15.	3	600	0.4	8.0	12.1

It was impossible to analyze this result, because there was no effect in accordance with applied concentration and dosis about white head of rice stem borer (rarely occurred), the damaged grain of rice bug (in spite of some occurrence) and yield. Then it seems that there were some faults in carrying out this trial. It requires further examination.

[A]-2 SPRAYING DOSIS AND CONCENTRATION OF INSECTICIDE
FOR MAJOR INSECT PESTS ON UPLAND RICE

Desa: Reno Basuki

Kecamatan: Rumbia

Design: Randomized block (3 blocks) (1 plot = 4 x 5 m)

Variety: Cartuna (hill space = 40 x 15 cm)

Sowing time: December 26, 1978

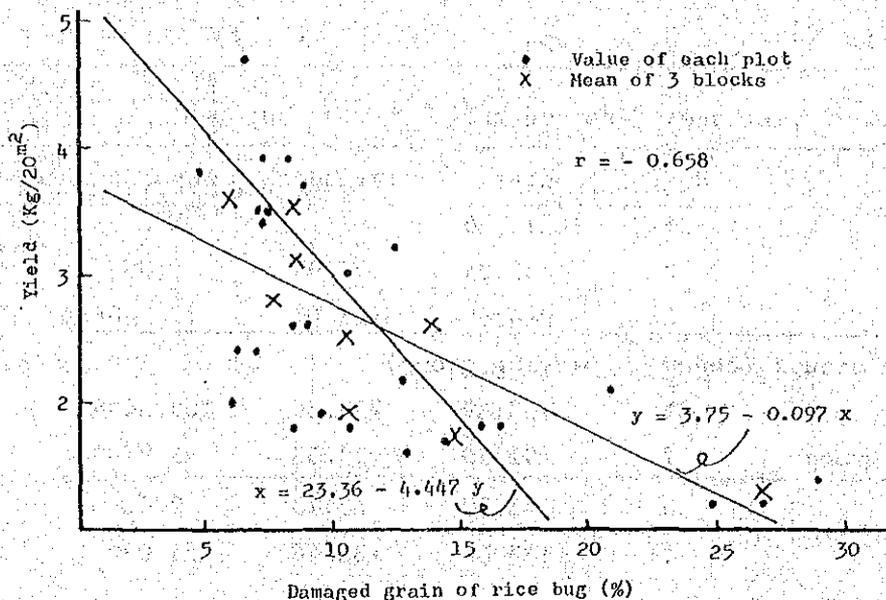
Insecticide: Diazinon 60 EC

Spraying times and period: 5 times (15, 35, 55, 75 and 95 days after sowing)

Results obtained are as follows:

treat- ment No.	concent- ration (cc/l)	dosis (l/Ha)	rice stem borer			rice bug	yield (Kg/20m ²)
			dead heart 30*(%)	white 60*(%)	head (%)	damaged grain (%)	
1.	0 (check)	0	15.1	16.0	19.4	26.7	1.3
2.	1	100	5.3	14.8	13.4	14.5	1.7
3.	1	200	13.9	1.0	10.8	10.5	1.9
4.	1	300	14.5	5.7	9.0	13.9	2.6
5.	1	400	16.3	13.7	5.4	10.2	2.5
6.	2	100	9.1	8.4	2.7	8.3	3.5
7.	2	200	12.3	13.5	7.2	8.4	3.1
8.	2	300	18.4	13.9	5.4	7.7	2.8
9.	2	400	19.1	4.9	7.9	5.9	3.6

* days after transplanting



1. It was impossible to analyze the result on the damage of rice stem borer (the head heart in 30 and 60 days after transplanting and the white head), because there was no effect in accordance with the applied concentration and dosis.

2. There were significant differences among above treatments in the damaged grain of rice bug.

no spraying (check) > spraying group (1%)
 concentration: 1 cc/1 > 2 cc/1 (1%)

3. There were significant differences among above treatments in yield.

no spraying (check) < spraying group (1%)
 concentration: 1 cc/1 < 2 cc/1 (1%)

4. The correlation coefficient between the damaged grain of rice bug and yield was -0.658, and regression formulae were

$y = 3.75 - 0.097 x$, $x = 23.36 - 4.47 y$
 (y = yield, x = damaged grain of rice bug (%))

5. Estimation of yield decrease by the damage of rice bug

x damaged grain (%)	y ± 0.32 yield (Kg/20m ²)	estimated percentage of yield decrease
0	3.75	0
10	2.78	26
20	1.81	52
30	0.84	78

Analysis of variance: damaged grain of rice bug

Factor	d.f.	s.s	Variance	F-value
Total	26	1,110.86		
Block	2	55.94	27.94	4.05*
Treat	8	944.69	118.09	17.14**
Between groups (check : spraying group)				
	1	753.39	753.39	109.34**
Within group				
	7	191.30	27.33	3.97**
Dosis				
	3	41.20	13.73	2.48
Conc.				
	1	133.48	133.48	24.09*

D x C	3	16.62	5.54	
Error	16	110.23	6.89	
<hr/>				
yield				
<hr/>				
Factor	d.f.	s.s	Variance	F-value
Total	26	24.33		
Block	2	4.31	2.16	7.71**
Treat.	8	15.54	1.94	6.93**
<hr/>				
Between groups (check : spraying group)				
	1	5.61	5.61	20.04**
Within group	7	9.93	1.42	5.07**
<hr/>				
Dosis	3	1.12	0.37	
Conc.	1	6.82	6.82	10.33*
D x C	3	1.99	0.66	
Error	16	4.48	0.28	

Correlation coefficient:

$$S_{xy} = \Sigma xy - \Sigma x \Sigma y / 27 = 705.50 - 813.69 = 108.19$$

$$r = \frac{S_{xy}}{\sqrt{S_x^2 \times S_y^2}} = \frac{-108.19}{\sqrt{1,110.86 \times 24.33}} = 0.658$$

Regression coefficient:

$$b = \frac{S_{xy}}{S_x^2} = \frac{-108.19}{1,110.86} = 0.097$$

$$b = \frac{S_{xy}}{S_y^2} = \frac{-108.19}{24.33} = 4.447$$

[A]-3 SPRAYING PERIOD FOR
MAJOR INSECT PESTS ON SOYBEAN

Desa: Trans Tanjung Kecamatan: Ketibung

Design: Randomized block (3 blocks) (1 plot = 4 x 5 m)

Variety: Local one (hill space = 40 x 15 cm)

Sowing time: June 6, '79

Insecticide: Diazinon 60 EC (2 cc/l, 4001/Ha)

Results obtained are as follows:

treatment No.	spraying period (days after sowing)	bean fly damaged stem (%)	lima-bean pod borer damaged pod (%)	yield (Kp/20m ²)
1.	-- -- -- -- (check)	10.6	25.0	0.6
2.	7, 21, 35, 49	5.6	17.7	1.1
3.	10, 24, 38, 52	5.9	16.7	0.7
4.	13, 27, 42, 55	4.0	20.0	0.8
5.	16, 30, 45, 58	0.0	13.0	1.3
6.	19, 33, 48, 51	6.2	15.0	1.0
7.	22, 36, 50, 64	6.3	16.0	0.8
8.	25, 39, 53, 67	4.9	17.0	0.9

1. There were no significant differences among above spraying periods in the damaged stem of bean fly, and these differences were not recognized as the effect caused by the difference of spraying period.
2. There were significant differences between check and a spraying group in the damaged pod of lima-bean pod borer, but no significant differences within group.
3. There were significant differences between above each treatment in yield, but there was a low correlation between the damaged pod and yield. (correlation coefficient = -0.483)
Then it seems to be recognized that some factors influenced on a yield except the occurrence of lima-bean pod borer.

Analysis of variance
damaged stem of bean fly

Factor	d.f.	s.s.	Variance	F-value
Total	23	577.72		
Block	2	126.46	63.23	3.24
Treat.	7	177.64	25.38	1.30
Error	14	273.62	19.54	

damaged pod of
lima-bean pod borer

Total	23	404.0		
Block	2	46.1	23.1	3.98*
Treat.	7	276.7	39.5	6.81*
Between groups (check : spraying group)				
	1	190.8	190.8	32.90**
Within group				
	6	85.9	14.3	2.47
Error	14	81.2	5.8	

yield

Total	23	1.85		
Block	2	0.31	0.16	5.33**
Treat.	7	1.09	0.16	5.33*
Error	14	0.45	0.03	

1sd. = 0.18 (5%)

Correlation coefficient:

$$S_{xy} = \Sigma_{xy} - \Sigma_x \cdot \Sigma_y / 24 = 363.9 - 377.1 = -13.2$$

$$r = \frac{S_{xy}}{\sqrt{S_x^2 \cdot S_y^2}} = \frac{-13.2}{\sqrt{404.0 \times 1.85}} = -0.483$$

[A]-4 SPRAYING TIME FOR LIMA-BEAN
POD BORER ON PEANUT

Desa: Rabuhan Ratu

Kecamatan: Way Jepara

Design: Randomized block (3 blocks) (4 x 5 m)

Variety: Kidang (hill space 40 x 15 cm)

Sowing time: Nov. 29, '78

Harvesting time: Mar. 13, '79

Insecticide: Diazinon 60EC (2 cc/l, 400 l/Ha)

Results obtained are as follows:

No.	time	treatment spraying period*	lima-bean-pod borer damaged pod (%)	yield (Kg/20m ²)
1.	0 x	-- -- (check) -- --	8.0	2.1
2.	1 x	-- -- -- -- 70	2.1	2.2
3.	2 x	-- -- -- 60, 70	6.8	2.3
4.	3 x	-- -- 50, 60, 70	0.0	2.7
5.	4 x	-- 40, 50, 60, 70	8.0	2.2
6.	5 x	30, 40, 50, 60, 70	0.0	2.2

* days after sowing

It was impossible to analyze this result, because the effect of applied chemicals was recognized in some cases, but was not recognized entirely in others. It seems that there were some faults in carrying out this trial. It requires further examination.

[B] 病虫害の品種間差異

[B]-1 水 稲

[B]-1-1 OBSERVATION ON THE VARIETAL DIFFERENCE
AGAINST THE DAMAGE OF PESTS ON LOWLAND RICE

Desa: Gisting Bawah

Kecamatan: Talang Padang

Sowing time: Nov. 15, '79

Results obtained are as follows:

No.	variety	rice stem borer		sheath blight		yield (kg/50m ²)
		dead heart (%) (30 dat.*)	(60 dat.*)	intensity of damage (%) (30 dat.*)	(60 dat.*)	
1.	Sigadis	7.3	1.4	2.0	2.4	17.5
2.	IR 36	5.3	1.4	3.4	3.1	16.5
3.	IR 38	4.1	1.4	2.0	10.1	16.2
4.	Citarum	3.7	7.2	1.4	1.6	17.3
5.	Serayu	4.4	1.8	1.2	2.3	16.0
6.	Asahan	7.1	2.7	2.3	3.1	13.5
7.	Pelita	8.1	3.0	2.5	2.5	16.7

*dat. = days after transplanting.

- There were significant differences between tested varieties in the dead heart of rice stem borer on 30 days after transplanting.
Pelita > Sigadis, Asahan > IR 36 > Serayu, IR 38, Citrum.
But there were no significant differences in the same item on 60 days after transplanting.
- There were no significant differences in sheath blight and yield.

Analysis of variance:

Dead heart of rice stem borer on 30 days after transplanting	Factor	d.f.	s.s.	Variance	F-value
	Total	20	63.80		
	Block	2	0.91	0.46	
	Variety	6	55.60	9.25	14.9**
	Error	12	7.39	0.62	

lsd. = 1.3(1%), 0.9(5%)

[B]-1-2 OBSERVATION ON THE VARIETAL DIFFERENCE
 AGAINST THE DAMAGE OF PESTS ON LOWLAND RICE

Desa: Hadimulyo

Kecamatan: Metro

Sowing time:

Results obtained are as follows:

No.	Variety	Yield (Kg/50m ²)
1.	IR36	54.7
2.	Gati	34.2
3.	Citarum	41.2
4.	Serayu	41.5
5.	Asahan	43.5
6.	Brantas	54.3
7.	IR 38	44.7

Results obtained were yield only, then an influence on the damage of pests could not be analyzed. But there were significant differences in yield.
 Analysis of variance:

Yield	Factor	d.f.	s.s.	Variance	F-value
	Total	20	1,200.3		
	Block	2	8.3	4.15	
	Variety	6	983.2	163.87	9.42**
	Error	12	208.8	17.40	

lsd. = 4.9 (5%), 6.7 (1%)

[B]-1-3 OBSERVATION ON THE VARIETAL DIFFERENCE
 AGAINST THE DAMAGE OF PESTS ON LOWLAND RICE

Desa: Totokaton

Kecamatan: Punggur

Sowing time: Dec. 26, '79

Results obtained are as follows:

No.	Variety	white head of rice stem borer (%)	yield (Kg/50m ²)
1.	Gati	4.2	21.7
2.	Brantas	3.2	42.5
3.	Asahan	7.6	43.4
4.	Citarum	4.6	42.4
5.	IR 36	5.1	56.2
6.	IR 38	1.5	41.8
7.	Serayu	11.4	20.2

1. There were significant differences between tested varieties in the white head of rice stem borer and yield.

white head: Serayu > Asahan > IR 36, Citarum, Gati, Brantas > IR 38

Yield : IR 36 > Asahan, Brantas, Citarum, IR 38 > Gati, Serayu

2. But the damage of white head was not so much, then there was no correlation between above both items.

And these significant differences in the white head do not seem to be recognized as a general character of these varieties with only this result.

Analysis of variance:

white head of rice stem borer	Factor	d.f.	s.s.	Variance	F-value
	Total	20	250.02		
	Block	2	6.23	3.17	
	Variety	6	191.94	31.99	7.40*
	Error	12	51.85	4.32	

1sd. = 2.8 (5%), 3.8 (1%)

yield	Factor	d.f.	s.s.	Variance	F-value
	Total	20	3,005.20		
	Block	2	2.04	1.02	
	Variety	6	2,987.89	497.98	392.11**
	Error	12	15.27	1.27	

lsd. = 4.5 (5%), 6.3 (1%)

[B]-1-4 OBSERVATION ON THE VARIETAL DIFFERENCE
 AGAINST THE DAMAGE OF PESTS ON LOWLAND RICE

Desa: Rukti Harjo

Kecamatan: Septih Raman

Sowing time: Feb. 5, '80

Hervesting time: May 5, '80.

Results obtained are as follows:

No.	variety	yield (Kg/50m ²)
1.	Serayu	30
2.	Brantas	27
3.	Citarum	28
4.	Asahan	24
5.	IR 36	26
6.	IR 38	23

1. In this trial, the varietal difference against the damage of pests can not be analyzed, because results obtained were about yield only.
2. There were significant differences between tested varieties in yield.
 Serayu > Citarum, Brantas, IR 36 > Asahan, IR 38
3. It requires further examination.

Analysis of variance:

yield	Factor	d.f.	s.s.	Variance	F-value
	Total	17	136.00		
	Block	2	0.33	0.17	
	Variety	5	100.00	20.00	5.61*
	Error	10	35.67	3.67	

1sd. = 2.4 (5%)

[B]-1-5 OBSERVATION ON THE VARIETAL DIFFERENCE
AGAINST THE DAMAGE OF PESTS ON LOWLAND RICE

Desa: Banar Joyo Kecamatan: Batanhari

Sowing time: Jan. 2, '80

Harvesting time: May 3 -- 18, '80.

Results obtained are as follows:

No.	variety	yield (Kg/50m ²)	
1.	Asahan	25.3	
2.	IR 38	26.2	
3.	Citarum	22.7	
4.	IR 36	29.0	
5.	Brantas	27.5	
6.	Serayu	29.3	
7.	Gati	10.0	(damaged by plant hopper)

- In this trial, the varietal difference against the damage of pests can not be analyzed because results obtained were about yield only.
- There were significant differences between tested varieties in yield.
 Serayu > IR 36 > Brantas, IR 38 > Asahan, Citarum > Gati
- It requires further examination.

Analysis of variance:

yield	Factor	d.f.	s.s.	Variance	F-value
	Total	20	921.57		
	Block	2	17.64	8.82	1.16
	Variety	6	814.40	135.73	17.84**
	Error	12	89.53	7.61	

1sd. = 3.2 (5%), 4.6 (1%)

[B]-1-6 OBSERVATION ON THE VARIETAL DIFFERENCE
AGAINST THE DAMAGE OF PESTS ON LOWLAND RICE

Desa: Gunung sari Kecamatan: Kedondong

Design: Randomized block (3 blocks)
 (1 plot : 5 x 10 m)

Sowing time: Feb. 2, '80

Results obtained (means of 3 blocks) are as follows:

No.	variety	yield (Kg/50m ²)
1.	IR 36	34
2.	IR 38	31
3.	Serayu	33
4.	Asahan	30
5.	Citrum	31
6.	Pelita I-1	33
7.	Bulu putih	29

Results obtained were about yield only, then a varietal influence on the damage of pests could not be analyzed. There were no significant differences among tested varieties in yield.

Analysis of variance:

yield	Factor	d.f.	s.s.	Variance	F-value
	Total	20	778		
	Block	2	3	1.50	--
	Variety	6	56	9.33	--
	Error	12	719	59.91	

(B)-2 陸 稻

[B]-2-1 OBSERVATION ON THE VARIETAL DIFFERENCE
AGAINST THE DAMAGE OF PESTS ON UPLAND RICE

Desa: Tran Tanjungan Kecamatan: Ketibung

sowing time: Oct. 7, '79

Results obtained are as follows:

No.	variety	rice stem borer		rice bug	neck blast	yield
		dead heart (%)	white head (%)	damaged grain (%)	damaged head (%)	
1.	Gata	2.8	1.2	11.9	2.2	25.5
2.	Gati	1.8	0.4	17.3	2.0	22.0
3.	Bicol	4.7	0.0	13.2	5.3	20.6
4.	Sirendah putih	1.9	1.7	9.3	6.4	20.5
5.	Sirendah kuning	1.3	0.0	8.4	6.2	19.3
6.	Cempoturi	1.3	0.8	9.7	5.3	19.2
7.	100 malam	0.8	2.7	10.7	4.1	18.3
8.	Cartuna	1.9	0.0	13.7	7.2	16.8
9.	Sirebang	2.5	0.0	18.3	6.2	13.7

In the results of this trial, there were no significant differences between nine applied varieties in observed pests. But there were significant differences between varieties in yield.

It requires further examination.

Analysis of variance:

yield	Factor	d.f.	s.s.	Variance	F-value
	Total	26	329.85		
	Block	2	3.13	1.57	
	Variety	8	262.85	32.86	8.23**
	Error	16	63.87	3.99	

lsd. = 2.75 (1%)

[B]-2-2 OBSERVATION ON THE VARIETAL DIFFERENCE
 AGAINST THE DAMAGE OF PESTS ON UPLAND RICE

Desa: Tanjung Jaya Kecamatan: Bangung Rejo

Sowing time: Nov. 6, '79

Results obtained are as follows:

No.	variety	rice stem borer dead heart (%)	rice bug damaged grain(%)	yield (Kg/50m ²)
1.	IR 36	3.3	10.7	21.2
2.	Gati	3.8	8.7	18.0
3.	Bicol	1.6	9.5	16.3
4.	Sirebang	4.2	10.9	14.5
5.	100 malam	4.9	9.3	17.6
6.	Cartuna	5.8	6.9	15.2
7.	Cempoturi	4.1	6.1	15.8
8.	Sirendah kuning	4.7	5.3	18.2
9.	Sirendah putih	2.5	4.8	21.7

1. There were significant differences between tested varieties in the dead heart of rice stem borer (5%) and the damaged grain of rice bug (10%), but both damage was not so much. Then these differences do not seem to be recognized as a general character of these varieties with only this result.

2. There was no correlation yield and damage of both insect pests.

Analysis of variance:

Dead heart of rice stem borer	Factor	d.f.	s.s.	Variance	F-value
	Total	26	75.69		
	Block	2	16.18	8.09	6.18*
	Variety	8	38.60	4.89	3.69*
	Error	16	20.91	1.31	

lsd. = 1.14 (5%)

Damaged grain of rice bug	Factor	d.f.	s.s.	Variance	F-value
	Total	26	185.91		
	Block	2	3.07	1.54	
	Variety	8	124.50	15.56	2.13 (10%)
	Error	16	58.34		

1sd. = 2.28 (10%)

[B]-2-3. OBSERVATION ON THE VARIETAL DIFFERENCE
 AGAINST THE DAMAGE OF PESTS ON UPLAND RICE

Desa: Sri Kencono Kecamatan: Rumbia

Sowing time: Nov. 15, '79

Results obtained are as follows:

No.		rice stem borer		rice bug	yield (Kg/50m ²)	
		dead heart (%) 30 das.*	60 das.*	white head (%)		damaged grain(%)
1.	Sirendah kuning	12.5	2.4	2.2	23.8	21.90
2.	Sirebang	2.2	13.9	9.7	9.6	18.30
3.	100 malam	13.4	3.2	0.4	9.8	13.47
4.	IR 36	2.3	14.7	0.7	51.9	20.40
5.	Cartuna	0.0	11.5	25.4	21.2	14.73
6.	Cempoturi	24.0	4.4	20.7	59.9	13.07
7.	Gata	11.3	1.1	1.2	51.9	22.47
8.	Gati	4.2	13.2	1.4	31.5	18.00
9.	Bicol	0.6	7.3	5.0	18.6	14.13
10.	Sirendah putih	2.5	2.7	4.0	32.3	24.27

* das. = days after sowing

1. There were no significant differences between tested varieties in the percentage of dead heart of rice stem borer (30 and 60 days after sowing).
2. There were significant differences between tested varieties in white head of rice stem borer.

Cartuna, Cempoturi > Sirebang, Bicol, Sirendah putih,
 Sirendah kuning, Gati, Gata, IR36, 100 malam

Cartuna and Cempoturi were much damaged than other varieties in white head of stem borer (1%), and it seems that their damages influenced on their yield mostly. But it does not seem to be recognized as a general character that above two varieties were susceptible to white head of rice stem borer with only this result.

3. There were significant differences between tested varieties in the damaged grain of rice bug.

Cempoturi, IR36, Gata > Sirendah putih, Gati

Sirendah kuning, Cartuna, Bicol > 100 malam, Sirebang

Cempoturi, IR36 and Gata showed the highest percentage on the damaged grains by rice bug, and Sirendah putih and Gati showed the second highest. But Sirendah putih showed the highest yield, and Gata and IR36 showed the second highest, so it is doubtful whether the method or the judgement of the observation were adequate or not.

4. There were significant differences between tested varieties in yield.

Sirendah putih, Gata > Sirendah kuning, IR 36 > Sirebang,

Gati > Cartuna, Bicol, 100 malam, Cempoturi

Sirendah putih showed the highest yield among tested varieties, but Cempoturi, 100 malam, Bicol and Cartuna showed low yield. It is regrettable that an investigation of a neck blast was not carried out.

Analysis of variance:

White head of rice stem borer	Factor	d.f.	s.s.	Variance	F-value
	Total	29	3,349.75		
	Block	2	114.85	57.43	
	Variety	9	2,165.38	240.54	4.05**
	Error	18	1,069.52	59.42	
	1sd. = 9.92 (1%)				
Rice bug	Total	29	13,300.83		
	Block	2	283.73	141.87	
	Variety	9	8,758.84	973.14	4.11**
	Error	18	4,258.84	236.60	
	1sd. = 19.80 (1%)				
Yield	Total	29	5,833.19		
	Block	2	13.95	1,549.7	
	Variety	9	4,537.12	2,268,558.5	31.85**
	Error	18	1,282.12	71,229.1	
	1sd. = 14.57 (1%), 10.37 (5%)				

[B]-2-4 OBSERVATION ON THE VARIETAL DIFFERENCE
 AGAINST THE DAMAGE OF PESTS ON UPLAND RICE

Desa: Gampur Asri Kecamatan: Baradatu

Sowing time: Oct. 24, '79

Results obtained are as follows:

No.	variety	rice stem borer		neck blast damaged head(%)	yield (Kg/25m ²)
		dead heart (%)	* white head(%)		
1.	IR36	3.1	3.6	--	7.8
2.	Gati	2.9	1.6	--	9.8
3.	Bicol	4.8	5.9	32.6	12.9
4.	Sirebang	7.0	7.1	--	8.7
5.	100 malam	4.2	5.7	--	10.0
6.	Cartuna	5.7	6.8	--	10.7
7.	Cempoturi	6.5	5.6	--	11.2
8.	Sirendah kuning	7.7	9.7	--	8.1
9.	Sirendah putih	8.3	7.1	--	10.3

* (45 days after sowing)

1. Damage of the dead heart and the white head of rice stem borer was less than 10%.
2. There were significant differences between tested varieties in the dead heart of rice stem borer but damage occurred a little, then these differences do not seem to be recognized as a general character of these varieties with only this result.
3. There were no significant differences in the white head of rice stem borer and yield.
4. Yield of Bicol was the highest among 9 varieties, in spite of about 30% occurrence of neck blast.

Analysis of variance:

Dead heart of rice stem borer	Factor	d.f.	s.s.	Variance	F-value
	Total	26	178.41		
	Block	2	20.36	10.18	2.45
	Variety	8	91.76	11.47	2.77*
	Error	16	66.29	4.17	

1sd. = 2.03 (5%)

[C] 播種時期と病虫害発生との関係

[C]-1 水 稲

[C]-1-1 RELATION BETWEEN THE OCCURRENCE OF PESTS
AND THE SOWING TIME ON LOWLAND RICE

Desa: Benar Joyo

Kecamatan: Bastang hari

Variety: IR 36

Results obtained are as follows:

No.	sowing time	yield (Kg/50m ²)
1.	Jan. 12, '80	32.1
2.	Jan. 25, '80	34.3
3.	Feb. 11, '80	35.4
4.	Feb. 8, '80	33.5
5.	Feb. 15, '80	32.7

1. In this trial, the relation between the occurrence of pests and the sowing time can not be analyzed, because results obtained were about yield only.
2. There were no significant differences between tested sowing time in yield.
3. It requires further examination.

[C]-1-2 RELATION BETWEEN THE OCCURRENCE OF PESTS
AND THE SOWING TIME ON LOWLAND RICE

Desa: Wargo mulyo Kecamatan: Paradasuka

Design: Randomized block (5 blocks)(1 plot: 5 x 10 m)

Variety: IR 36

Results obtained (means of 5 blocks) are as follows:

No.	sowing time	yield (Kg/50m ²)
1.	Jan. 30, '80	31
2.	Feb. 6, '80	33
3.	Feb. 13, '80	35
4.	Feb. 20, '80	36
5.	Feb. 27, '80	32

In this trial, the relation between the occurrence of pests and the sowing time could not be analyzed, because results obtained were about yield only. There were no significant differences among tested sowing time in yield.

Analysis of variance:

yield	Factor	d.f.	s.s.	Variance	F-value
	Total	24	346.2		
	Block	4	37.4	9.35	
	Time	4	110.6	27.65	2.23
	Error	16	198.2	12.39	

[C]-2-1 RELATION BETWEEN THE OCCURRENCE OF PESTS
AND THE SOWING TIME ON UPLAND RICE

Desa: Campur Asri

Kecamatan: Baradatu

Variety: Sirendah

Results obtained are as follows:

No.	sowing time	rice stem borer		yield (Kg/50m ²)
		dead heart (%)	white head (%)	
1.	Oct. 22, '79	15.4	8.1	8.8
2.	Nov. 5, '79	4.5	5.4	9.6
3.	Nov. 29, '79	----	----	----
4.	Dec. 13, '79	----	----	----
5.	Dec. 27, '79	----	----	----

In this trial, all upland rice sowed after the end of November were destroyed by the damage of rice seeding fly. Nevertheless, it is very regrettable to be no data of rice seeding fly.

Every items in above table were no significant differences.

Then in this area, seeds of upland rice should be sowed before the middle of November.

[C]-2-2 RELATION BETWEEN THE OCCURRENCE OF PESTS
AND THE SOWING TIME ON UPLAND RICE

Desa: Kembang Tanjung Kecamatan: Abeng Selatan

Variety: Sirendah

Results obtained are as follows:

No.	sowing time	yield (Kg/50m ²)
1.	Oct. 25, '79	15.8
2.	Nov. 11, '79	23.8
3.	Nov. 22, '79	22.6
4.	Dec. 6, '79	--
5.	Dec. 30, '79	--

In this trial, all upland rice sowed on December were destroyed by the damage of rice seedling fly. Nevertheless, it is very regrettable to be no data of rice seedling fly. There were significant differences between No. 1 and Nos. 2-3 in yield.

Then in this area seeds of upland rice should be sowed on November.

[C]-3 大豆

[C]-3-1 RELATION BETWEEN THE OCCURRENCE OF PESTS
AND THE SOWING TIME ON SOYBEAN

Desa: Tran Budidaya

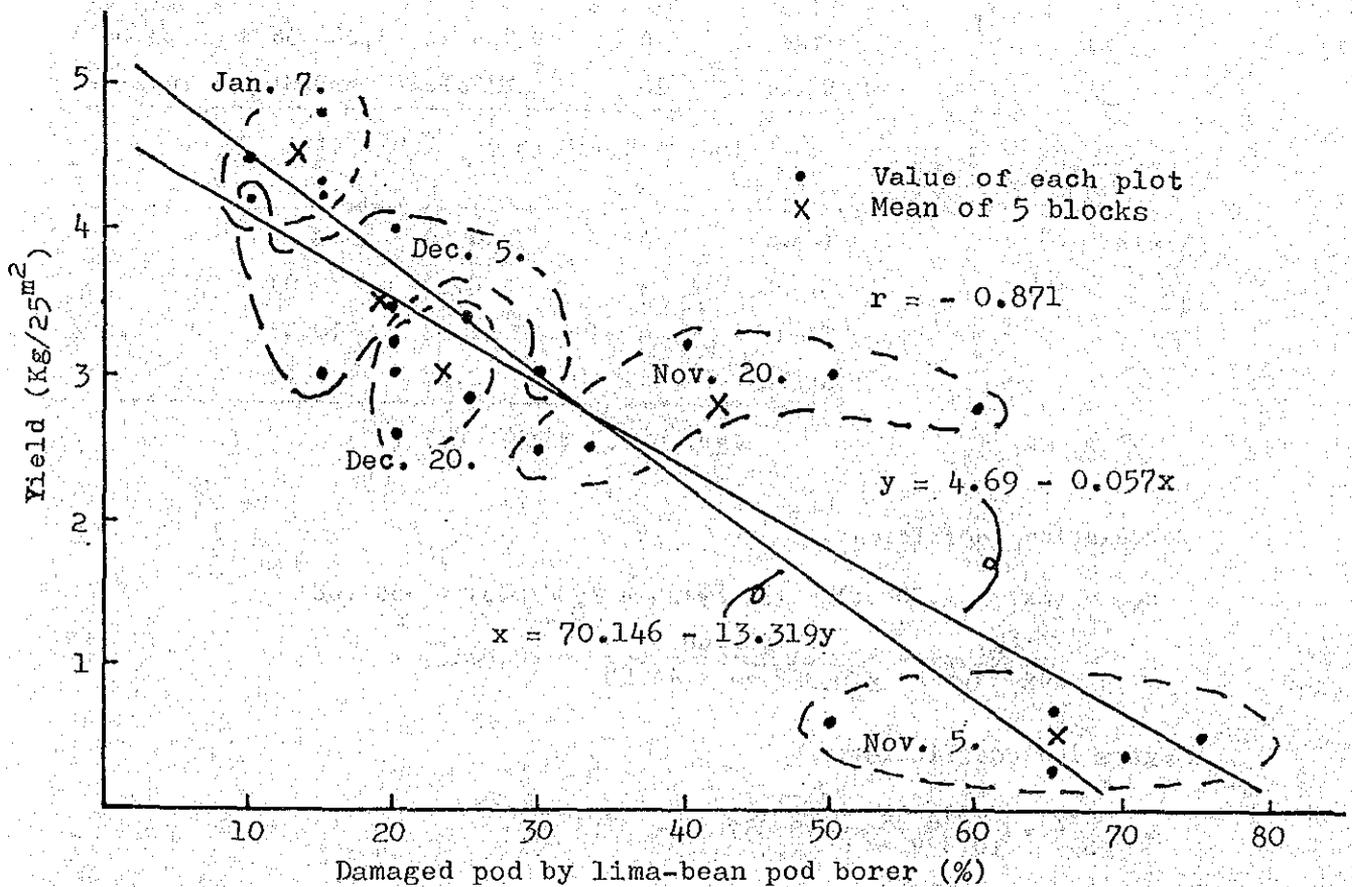
Kecamatan: Ketibung

Variety: Local one

Results obtained are as follows:

No.	sowing time	bean fly damaged stem		lima-bean pod borer damaged pod (%)	yield (Kg/25m ²)
		21 das.*	42 das.*		
1.	Nov. 5, '79	0.0	1.3	65	0.5
2.	Nov. 20, '79	1.3	0.0	42	2.8
3.	Dec. 5, '79	4.0	0.0	19	3.5
4.	Dec. 20, '79	0.0	0.6	23	3.0
5.	Jan. 7, '80	0.0	2.0	13	4.5

* das = days after sowing



1. In this trial, the damage of bean fly was rarely found, so the influence on the yield could not be found out.
2. There was recognized serious damage by lima-bean pod borer at the plots of early sowing time, so these yields mostly decreased. There were significant differences between sowing time on the damage of lima-bean pod borer.
3. There was a high minus correlation between the damaged pod and yield, and the coefficient of correlation was -0.871 .
4. According to the result it seems that a good time of sowing on soybean in this district was the beginning of January.

Analysis of variance:

Damaged pod of

lima-bean pod borer

Factor	d.f.	s.s.	Variance	V-value
Total	24	10,399.44		
Block	4	432.24	108.06	2.13
Time	4	9,154.24	2,288.56	45.04**
Error	16	812.96	50.81	

1sd. = 2.120 (5%), 2.921 (1%)

Yield

Total	24	44.50		
Block	4	0.17	0.04	
Time	4	42.13	10.53	75.21**
Error	16	2.20	0.14	

1sd. = 0.5 (5%), 0.7 (1%)

Correlation coefficient:

$$S_{xy} = (\Sigma xy = 1,708.5) - (\Sigma x \cdot \Sigma y / 25 = 2,301.53) = -592.68$$

$$r = \frac{S_{xy}}{\sqrt{S_x^2 \cdot S_y^2}} = \frac{-592.68}{\sqrt{10,399.44 \times 44.50}} = -0.871$$

Regression coefficient:

$$b = \frac{S_{xy}}{S_x^2} = \frac{-592.68}{10,399.44} = -0.057$$

$$b' = \frac{S_{xy}}{S_y^2} = \frac{-592.68}{44.50} = -13.319$$

[C]-3-2 RELATION BETWEEN THE OCCURRENCE OF PESTS
AND THE SOWING TIME ON SOYBEAN

Desa: Asahan

Kecamatan: Jabung

Variety: Local one

Results obtained are as follows:

No.	sowing time	Bean fly damaged stem (%)	yield ² (Kg/25m ²)
1.	Oct. 13, '79	--	--
2.	Nov. 3, '79	--	--
3.	Nov. 24, '79	--	--
4.	Dec. 15, '79	4.5	1.5
5.	Jan. 5, '80	5.6	2.1

In this trial, seeds of soybean at the plots of Nos. 1 - 3 did not germinate for no rainfall.

It requires further examination.

[C]-4-1 RELATION BETWEEN THE OCCURRENCE OF PESTS
AND THE SOWING TIME ON MAIZE

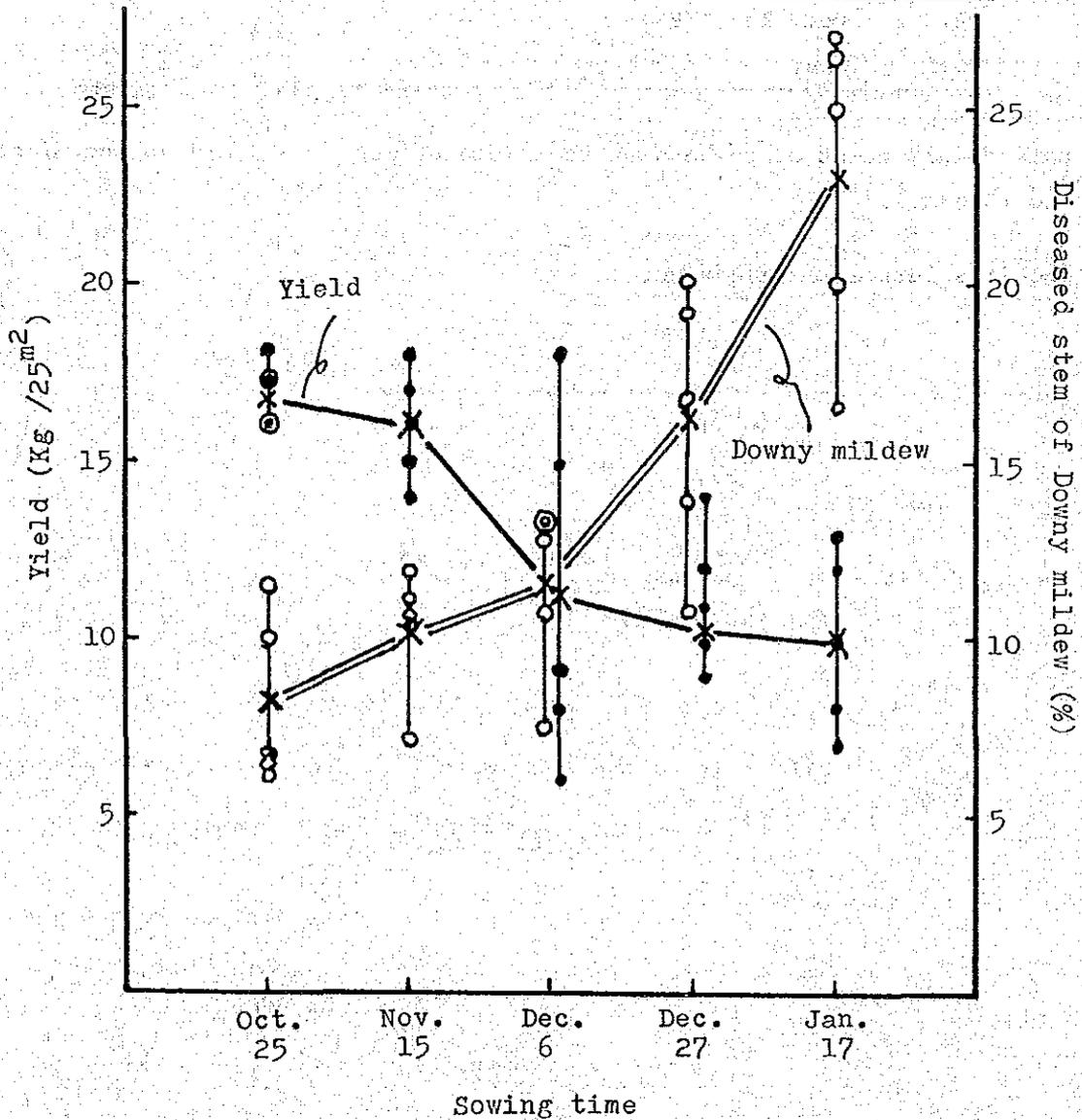
Desa: Sribawono

Kecamatan: Labhan Maringgai

Variety: Harapan Baru

Results obtained are as follows:

No.	Sowing Time	Diseased Stem of Downy Mildew (%)	Yield (Kg/25m ²)
1.	Oct. 25, '79	8.1	16.8
2.	Nov. 15, '79	10.2	16.0
3.	Dec. 6, '79	11.5	11.2
4.	Dec. 27, '79	16.1	11.0
5.	Jan. 17, '80	23.0	10.0



1. There were significant differences between Nos. 1-3, No. 4 and No. 5 in percentages of downy mildew. (Nos. 1-3 < No. 4 < No. 5)
2. There were significant differences between Nos. 1-2 and Nos. 3-5 in yield. (Nos. 1-2 < No. 3-5)
3. Correlation coefficient between above two items was -0.428, and was not so high. Then, it seems to be recognized that some factors influenced to a yield except an occurrence of downy mildew.
4. According to the result, it seems that a good time of sowing on maize in this district was until the middle of November.

Analysis of Variance

Downy mildew

Factor	d.f.	s.s.	Variance	F-value
Total	24	907.67		
Block	4	47.82	11.96	1.23
Time	4	703.82	175.96	18.05**
Error	16	156.03	9.75	

lsd. = 4.19 (0.05) - 5.77 (0.01)

Yield

Factor	d.f.	s.s.	Variance	F-value
Total	24	350		
Block	4	56	16.5	2.75
Time	4	198	45.6	7.60**
Error	16	96	6.0	

lsd. = 3.2 (0.05), 4.5(0.01)

Correlation coefficient

$$(\sum xy = 4,234.5) - (\sum x \sum y / 25 = 4,475.9) = (\text{S.S. of } xy = -241.5)$$

$$r = \frac{S_{xy}}{\sqrt{S_x^2 \cdot S_y^2}} = \frac{-241.5}{\sqrt{907.67 \times 350}} = -0.428$$

[C]-4-2 RELATION BETWEEN THE OCCURRENCE OF PESTS
AND THE SOWING TIME ON MAIZE

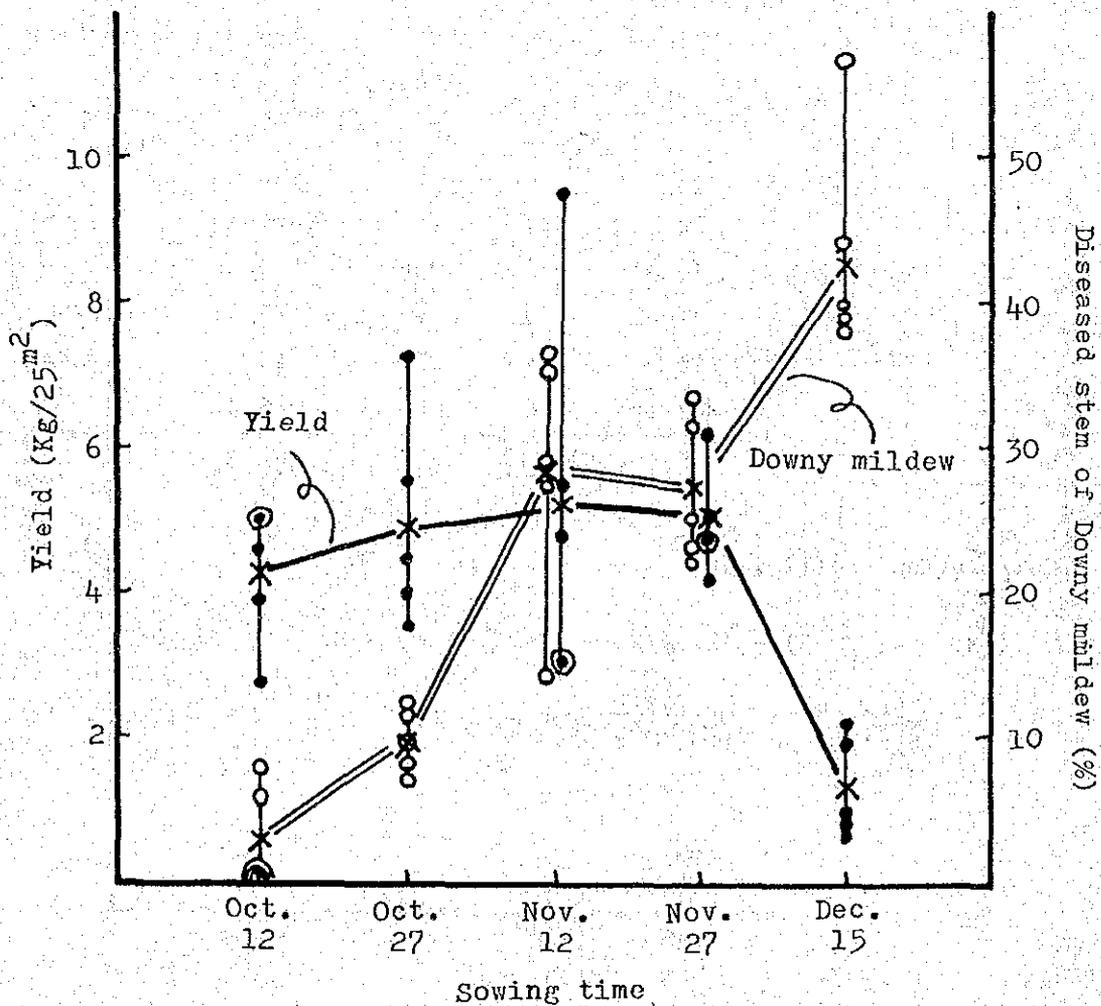
Desa: Bulusari

Kecamatan: Gunung Sugih

Variety: Harapan Baru

Results obtained are as follows:

No.	Sowing Time	Diseased Stem of Downy Mildew (%)	Yield (Kg/25m ²)
1.	Oct. 12, '79	2.9	4.3
2.	Oct. 27, '79	9.6	4.9
3.	Nov. 11, '79	28.6	5.2
4.	Nov. 27, '79	27.2	5.0
5.	Dec. 15, '79	43.4	1.3



1. There were significant differences between Nos. 1 - 2, Nos. 3 - 4 and No. 5 in percentages of downy mildew.

$$(\text{Nos. 1 - 2}) < (\text{Nos. 3 - 4}) < \text{No. 5}$$

2. There were significant differences between Nos. 1 - 4 and No. 5 in yield.

$$(\text{Nos. 1 - 4}) > \text{No. 5}$$

3. Correction coefficient between above two items was -0.48 and was not so high. It seems to be recognized that some factors (especially maybe rainfall in No. 1 and No. 2) influenced on a yield except an occurrence of downy mildew.

4. According to the result, it seems that a good time of sowing on maize in this district was until the end of November.

Analysis of variance:

Downy mildew	Factor	d.f.	s.s.	Variance	F-value
	Total	24	5,973.90		
	Block	4	182.31	45.58	1.28
	Time	4	5,222.77	1,395.69	36.72**
	Error	16	568.82	35.55	

$$\text{lsd.} = 7.99 (0.05), 11.01 (0.01)$$

Yield	Factor	d.f.	s.s.	Variance	F-value
	Total	24	97.87		
	Block	4	8.26	2.07	
	Time	4	51.59	12.90	5.43**
	Error	16	38.02	2.38	

$$\text{lsd.} = 2.07 (0.05), 2.85 (0.01)$$

Correlation coefficient:

$$(\Sigma xy = 1938.34) - (\Sigma x \cdot \Sigma y / 25 = 2305.49) = -367.15$$

$$r = \frac{S_{xy}}{\sqrt{S_x^2 \cdot S_y^2}} = \frac{-367.15}{\sqrt{5973.90 \times 97.87}} = -0.48$$