

**ALL INDIA COORDINATED RICE
IMPROVEMENT PROJECT
(AICRIP)**

Entomology Technical Programme

Kharif 2011

**Directorate of Rice Research
Rajendranagar, Hyderabad 500 030**

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COORDINATED ENTOMOLOGY TRIALS, *Kharif* 2011

S. No.	Location	P S R	P H S	F H S	G M S	G M S	L F S T	G E M P	M R S T	N S N 1	N S N 2	N S N H	N S N S	G M B T	G M P M	I E T	P C T	I R C P	T C S B	E P M	M P N E	Y L E T	I P M S	L T	No. of trials allotted
1	Aduthurai	*		*			*		*				*			*	*					*		*	9
2	Almora	*	*						*			*									*			*	6
3	Annamalainagar	*					*		*												*			*	5
4	Bankura	*					*		*	*			*			*					*			*	8
5	Bhubaneswar	*			*				*					*		*									6
6	Brahmavar	*			*	*					*		*	*	*	*					*				9
7	Chatha	*							*			*	*			*					*			*	7
8	Chinsurah	*					*		*	*						*	*	*	*		*	*	*	*	12
9	Coimbatore	*	*	*			*		*		*					*	*	*		*				*	11
10	Cuttack	*	*						*					*		*									5
11	Faizabad	*					*		*	*			*			*	*				*			*	9
12	Gangavathi	*	*				*		*				*			*	*				*			*	9
13	Ghaghrahat	*							*	*	*					*	*		*		*	*			9
14	Iroisemba	*	*		*			*	*					*		*								*	8
15	Jagdalur	*					*		*		*			*		*	*					*		*	9
16	Karaikal	*					*		*							*		*			*			*	7
17	Karjat	*	*					*	*	*	*	*	*			*			*		*		*	*	11
18	Kaul	*	*	*			*		*		*	*	*			*				*	*		*	*	11
19	Khudwani	*					*	*	*		*	*									*		*	*	9
20	Ludhiana	*	*	*			*	*	*	*						*		*			*	*		*	12
21	Madurai	*	*	*										*	*	*					*			*	8
22	Malan	*	*				*		*	*		*				*	*				*			*	10
23	Mandya	*	*	*	*			*	*	*				*		*				*	*			*	11
24	Maruteru	*	*	*				*	*		*	*				*					*	*		*	11

S. No.	Location	PSR	PHS	FHS	GMS	GMS	LFS	GEM	MRS	NSN1	NSN2	NSNH	NSHN	GMB	GMP	IET	PCT	IRCP	TCSB	PEM	MPE	YLET	IPMS	LT	No. of trials allotted
25	Moncompu	*			*	*					*			*	*	*					*			*	9
26	Navasari	*	*				*				*					*	*				*			*	8
27	Nawagam	*	*					*	*	*			*			*					*			*	9
28	Nellore	*			*				*					*							*			*	6
29	New Delhi	*	*	*												*					*			*	6
30	Pantnagar	*	*						*	*	*		*			*	*				*			*	10
31	Patna	*							*	*	*					*					*			*	7
32	Pattambi	*			*				*					*	*	*	*							*	8
33	Pudicherry	*					*		*	*	*					*	*					*		*	9
34	Pusa	*	*						*		*						*		*						6
35	Ragolu	*			*	*		*	*		*			*	*	*					*			*	11
36	Raipur	*	*	*	*	*			*	*	*		*	*	*	*			*		*			*	15
37	Rajendranagar	*					*		*	*						*		*	*		*			*	9
38	Ranchi	*			*	*			*	*				*		*	*	*					*	*	11
39	Rewa	*	*				*		*				*			*	*	*			*			*	10
40	Sakoli	*	*		*	*					*			*	*	*								*	9
41	Sambalpur	*	*		*	*								*		*	*					*	*	*	10
42	Titabar	*							*					*		*	*					*			6
43	Upper Shillong	*							*			*		*		*					*			*	7
44	Wangbal	*			*	*			*		*					*								*	7
45	Warangal	*			*	*			*	*				*	*	*					*			*	10
No. of locations allotted		45	21	9	14	10	17	8	35	18	18	15	3	17	9	40	7	7	6	4	29	8	6	39	395

Bold : Funded Centers

* = Trial allotted

COORDINATED ENTOMOLOGY TRIALS, RABI – 2012

No.	Locations	PSR	IE T	PC T	IRC P	TCS B	EEM	MPN E	YLE T	IP M (S)	L T	No. of Trials
1	Aduthurai	*	*	*		*		*			*	6
2	Chinsurah	*	*	*					*	*	*	6
3	Coimbatore	*	*	*							*	4
4	Cuttack	*	*									2
5	Gangavathi	*	*	*							*	4
6	Karaikal	*		*				*			*	4
7	Karjat	*	*			*		*			*	5
8	Maruteru	*	*			*	*				*	5
9	Madurai	*	*					*			*	4
10	Moncompu	*	*	*		*		*			*	6
11	Nellore	*	*	*						*	*	5
12	Pattambi	*	*	*		*			*	*	*	7
13	Puducherry	*	*	*							*	4
14	Ragolu	*	*		*						*	4
15	Rajendranagar	*	*		*			*			*	5
16	Sambalpur	*	*	*							*	4
17	Titabar	*	*	*								3
18	Warangal	*	*					*			*	4
No. of locations allotted		18	17	11	2	7	1	7	2	3	16	79

DIRECTORATE OF RICE RESEARCH
RAJENDRANAGAR, HYDERABAD - 500 030.

Coordinated Entomology Trials, *kharif* 2011

- Name of the study : **Pest Survey Reports (PSR)**
- Objectives : To monitor and report incidence, buildup and outbreaks of insect pests of rice in the region catered by the AICRIP center. Quantification of area and intensity of damage and impact on yield.
- Method : Visit, survey and surveillance and interaction with local farmers.
- Periodicity : Once in a fortnight. At least six times in a crop season
- Target area : Covering the district where centre is located and 2-3 adjoining districts. In case of pest outbreaks, affected area may be specifically visited.
- Essential information : 1. Specific site & date visited – District, Mandal (Taluka), village (Give specific GPS coordinates, if feasible).
2. Area covered – in multiples of 10 ha
3. No. of fields specifically examined
4. Variety grown
5. Major pest(s) noticed
6. Severity of damage (slight, moderate, severe)
7. Any other production constraints noticed *viz.*, drought, flood, diseases etc.
- Desirable additional information in respect of severely damaged field(s) : 8. Age of crop in severely damaged field(s) (in DAT/DAS)
9. Plant protection measures adopted by the farmer prior to the visit with name & dates of insecticide application
10. Information on fertilizer/fungicide/weedicide application, if any.
11. Advise given to the farmer and followup report if feasible

Submission of report

As early as possible by e-mail (jbentur@yahoo.com & ent_sam@yahoo.co.in), not later than 15th and 30th of each month. Hard copies may be sent subsequently if e-mail is not acknowledged

Note: 1) Report may also be based on visit of farmers to the centre with samples of affected plants.

2) Submit report even if there are no appreciable pest damage in the region.

3) If required to visit an affected area, expenditure on POL for the purpose may be claimed with prior approval of the Project Director of DRR- e-mail request may be made for this purpose to seek permission.

DIRECTORATE OF RICE RESEARCH
RAJENDRANAGAR, HYDERABAD - 500 030.

Coordinated Entomology Trials, Kharif 2011

Pest Survey Report

AICRIP Centre :

Site visited/reported:

Date:

GPS Coordinates:

1. Specific site District, Mandal (Taluka), village		
2. Area covered – in multiples of 10 ha		
3. No. of fields specifically examined		
4. Variety grown		
5. Major pest(s) noticed		
6. Severity of damage (slight, moderate, severe)		
7. Any other production constraints noticed viz., drought, flood, diseases etc.		
8. Age of crop in severely damaged field(s) (in DAT/DAS)		
9. Plant protection measures adopted by the farmer prior to the visit with name & dates of insecticide application		
10. Information on fertilizer/ fungicide/ weedicide application, if any.		
11. Advice given to the farmer and follow up report if feasible		

Please send by e-mail to jbentur@yahoo.com and ento_sam@yahoo.co.in latest by 15th and 30th of every month

DIRECTORATE OF RICE RESEARCH
RAJENDRANAGAR, HYDERABAD - 500 030.

Coordinated Entomology Trials, Kharif 2011

- Name of the trial : **Planthopper Screening Trial (PHS)**
- Objectives : To study the reaction of cultures against brown planthopper and whitebacked planthopper with a view to identify the promising material.
- Entries : List to be enclosed along with seed material.
- A) Field Screening
- Replications : One.
- Planting date : Sowing and planting should be done so as to obtain high planthopper infestation.
- Spacing : 10 x 10 cm.
- Age of seedlings at planting : 3 - 3 1/2 weeks.
- Seedlings/hill : One.
- Check variety : Taichung Native 1 (Susceptible).
- Plot size : Two rows of 10 hills each. Nine rows of test variety alternating with one row of susceptible check TN 1. All around test entries, plant 10 infestor rows of tall, susceptible, long duration variety like Mahsuri
- Fertilizer : Apply fertilizers according to local recommendations to get higher yields (more N may be top-dressed to get higher infestation).
- Chemical control : 1. Nursery should be protected with suitable insecticide spray at 0.5 kg a.i./ha if other pests are in considerable number.
2. No control measures should be adopted after transplanting.

Observations :

1. Observe and report number of planthopper population on 10 plants/variety at 10 days interval from 60 days onwards till 10 days before harvest. Report number of BPH and WBPH/hill separately.
2. Report number of dead and surviving plants per variety first at the time of hopper burn in any of the varieties followed by another observation prior to harvest.
3. If hopper burn is not observed despite high PH population, record percent tiller mortality in 5 random hills per variety.
4. Report overall damage on 0-9 scale for each entry as described below.
 - 0 - No damage.
 - 1 - Slight yellowing of a few plants.
 - 3 - Leaves partially yellow.
 - 5 - Leaves with pronounced yellowing and some stunting or wilting and 10 - 25% of plants with hopper burn, remaining plants severely stunted.
 - 7 - More than half of the plants wilting or with hopper burn, remaining plants severely stunted.
 - 9 - All plants dead.

(N.B: If plant mortality is due to combined populations of BPH and WBPH and/or other causes specify them clearly).

If despite high planthopper population (50 hoppers/plant in S. check) plant mortality is not noticed rate entries on population basis as follows :

Damage score	Number/hill
0	0
1	Less than 5 insects
3	5.1 to 10
5	10.1 to 20
7	20.1 to 40
9	> 40

Special Instructions: It is important to ensure field reaction through following steps.

1. Erect a polythene sheet barrier of 2.5 feet height all around the planting area within 15 days after planting. For better results it is desirable to plant test entries in longitudinal strips not wider than 2 meters and each strip separately covered around with polythene sheet.
2. Collect adults and nymphs of planthoppers from adjacent areas or green house culture and release them uniformly in polythene confined area on 30, 40, 50 and 60 DAT.

3. Spray 0.002 per cent deltamethrin on feeder rows 35, 45, 55 and 65 DAT to ensure further build up of the pest population..
4. **Seed should be collected separately from each culture (5 low damaged hills/culture) which show very low damage. This seed should be sent to the Principal Scientist & Head, Department of Entomology, DRR, Hyderabad**

B) Greenhouse Screening

Wherever facilities are available, the entries are to be tested under greenhouse conditions by adopting standardized technique of mass screening (three replications). Infest trays at 3 leaf stage. Record damage on 0-9 scale as detailed below :

- 0 - No damage.
- 1 - Very slight damage.
- 3 - First and second leaves of most plants partially yellowing.
- 5 - Pronounced yellowing and stunting or about half of the plants wilting or dead.
- 7 - More than half of the plants wilting or dead and remaining plants severely stunted or dying.
- 9 - All plants dead.

Note : If in the past years PH incidence at your location is consistently high during *rabi* than *kharif*, the trial may be conducted during *rabi*.

DIRECTORATE OF RICE RESEARCH
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Coordinated Entomology Trials, Kharif 2011

Name of the trial	: Gall Midge Screening (GMS) / Gall Midge Special Screening (GMSS).
Objectives	: To assess the reaction of advanced cultures/donors against gall midge.
Entries	: As per list to be enclosed along with the seed material.
Replications	: One
Plot size	: 1 row of 20 hills per variety/culture.
Planting date	: One late planting (4 weeks later than normal planting). The idea is to adjust the time of planting in such a way as to synchronize the most vulnerable stage of the plant with peak emergence of the insect.
Spacing	: 15 x 15 cm.
Age of seedlings	: 3 - 3 1/2 weeks
Seedlings/hill	: One
Fertilizer	: Apply fertilizers according to local recommended practice for obtaining high yields (more N may be top-dressed to get higher infestation).

Observations :

- 1) At 30 and 50 DAT, observe all plants to report total plants and gall midge damaged plants.
- 2) Also record from a maximum of 10 damaged plants/entry the number of total tillers and silver shoots.

Special Instructions :

1. **Seed should be collected separately from each culture (5 damage free hills/culture) which show nil or very low incidence of gall midge. This seed should be sent to the Principal Scientist & Head, Department of Entomology, Directorate of Rice Research, Rajendranagar, Hyderabad - 500 030, A.P.**
2. No insecticide should be applied in this trial.
3. No weedicide should be applied in this trial.
4. In case pest population build-up is seen during post-tillering stage, induce fresh tillering in 50% of hills of each entry by cutting the tillers at water level and record the damage at peak periods.

DIRECTORATE OF RICE RESEARCH
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Coordinated Entomology Trials, *Kharif* 2011

Name of the trial	:	Leaf Folder Screening Trial (LFST)
Objective	:	To evaluate selected lines / varieties against leaf folder with a view to identify the promising entries
Entries	:	As per list enclosed along with seed material
Replications	:	one
Plot size	:	1 row of 20 hills per entry with one skip row between entries
Planting dates	:	Sowing and planting should be adjusted so as to coincide panicle initiation stage with high leaf folder infestation
Spacing	:	20 x 15 cm
Age of seedling	:	3 – 3 1/2 weeks
Seedlings per hill	:	One
Check variety	:	Taichung Native 1 (Susceptible)
Fertilizers	:	Apply fertilizers according to local recommendations to get higher yields. Also apply additional 40kg Urea/ha on 30, 40 & 50 DAT to get higher infestation.
Methodology	:	At 25 DAT, cover these entries with a nylon net and release leaf folder adults. Collect adults from neighbouring fields or laboratory/ glass house culture. Release adults two times, once at 30 DAT and second at 40 DAT @ 100 adults per release. Let the adults remain inside the net to lay eggs for a week and then remove the net.
Observations	:	Take observations twice, at 60 DAT and 80 DAT. In each entry, select 10 plants at random. Count the total number of leaves and damaged leaves (only if one-third of the leaf area is damaged, then only consider it as damaged leaf). Calculate per cent damaged leaves in each entry.
Special Instructions	:	Do not apply insecticides in the main field.

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Coordinated Entomology Trials, *Kharif* 2011

Name of the trial	: Germplasm Evaluation against Major Pests (GEMP)
Objective	: To note the reaction of land races/germplasm accessions against insect pests with a view to identify new sources of resistance.
Entries	: As per list to be enclosed along with seed material.
Replications	: One.
Planting dates	: Sow and plant two times at an interval of 15 days so as to obtain high pest incidence or adjust time of planting so as to catch peak pest infestation.
Spacing	: 20 x 15 cm
Age of seedlings	: 3 - 3 1/2 weeks.
Seedlings/hill	: One
Check variety	: Taichung Native 1 (Susceptible).
Plot size	: One row of 20 hills each. Skip one row in between the varieties
Plot arrangements	: Single row of check variety should be included after every 10 varieties/cultures.
Fertilizer	: Apply fertilizers according to local recommendations to get higher yields (more N may be top dressed to get higher infestation).

Observations:

- 1) Record observations on any two major pests only.
- 2) Whorl maggot/leaf folder/hispa: Count the total number of leaves and number of damaged leaves on at least 10 hills/variety at random at 30 and 45 DAT and at peak infestation.

- 3) Gall midge: Count total number of plants and number of damaged plants (bearing silver shoots) on 30 DAT and 50 DAT. Report percent plant damage.
- 4) Stem borer: Count the total number of tillers and number of deadhearts on at least 10 hills/variety at 30 DAT or 50 DAT. Also, record total panicle bearing tillers and white ear heads from 10 hills/variety prior to harvest.
- 5) Planthoppers and leafhoppers: Report average insect population/hill based on 10 hills/ variety and overall plant damage on 0-9 scale as detailed in PHS trial. Green house evaluations wherever feasible are to be done.
- 6) Thrips : Record the damage on 0-9 scale at seedling and tillering stages of crop growth as detailed below :

- 0 - No damage
- 1 - Rolling of terminal 1/3 area of 1st leaf.
- 3 - Rolling of terminal 1/3 - 1/2 area of 1st and 2nd leaves.
- 5 - Rolling of terminal 1/2 area of 1st, 2nd and 3rd leaves, yellowing of leaf tips.
- 7 - Rolling of entire length of all leaves, pronounced yellowing.
- 9 - Complete plant wilting, followed by severe yellowing and scorching.

- 7) Any other pests:

Record either pest population/plant or percent damage if pest has caused significant damage. Specify the pest.

Special Instructions:

- 1) Do not apply any insecticide either during nursery or in the main field.
- 2) Specify damage causing pest for each column or observation.
- 3) Report data only against those pests where pressure was moderate or high.
- 4) Damage in the check varieties is important for the trial to be considered as a valid test.

N.B : Record data separately for each of the pests.

Send the seeds from 10 best entries as per your evaluation to the Principal Scientist & Head, Department of Entomology, Directorate of Rice Research, Rajendranagar, Hyderabad - 500 030.

DIRECTORATE OF RICE RESEARCH
RAJENDRANAGAR, HYDERABAD - 500 030.

Coordinated Entomology Trials, *Kharif* 2011

Name of the trial	: Multiple Resistance Screening Trial (MRST)
Objective	: To note the reaction of promising advanced cultures against insect pests with a view to identify multiple resistant varieties.
Entries	: As per list to be enclosed along with seed material.
Replications	: One.
Planting dates	: Sow and plant two times at an interval of 15 days so as to obtain high pest incidence.
Spacing	: 20 x 15 cm
Age of seedlings	: 3 - 3 1/2 weeks.
Seedlings/hill	: One
Check variety	: Taichung Native 1 (Susceptible).
Plot size	: One row of 20 hills each with one skip row between varieties.
Plot arrangements	: Single row of check variety should be included after every 10 varieties/cultures.
Fertilizer	: Apply fertilizers according to local recommendations to get higher yields (more N may be top dressed to get higher infestation).

Observations :

- 1) Record observations on any two major pests only.
 - 2) Whorl maggot/leaf folder/hispa : Count the total number of leaves and number of damaged leaves on at least 10 hills/variety at random at 30 and 45 DAT and at peak infestation.
 - 3) Gall midge : Count total number of plants and number of damaged plants (bearing silver shoots) on 30 DAT and 50 DAT. Report percent plant damage.
 - 4) Stem borer: Count the total number of tillers and number of deadhearts on at least 10 hills/variety at 30 DAT or 50 DAT. Also, record total panicle bearing tillers and white ear heads from 10 hills/variety prior to harvest.

5) Planthoppers and leafhoppers: Report average insect population/hill based on 10 hills/variety and overall plant damage on 0-9 scale as detailed in PHS trial. Greenhouse evaluations wherever feasible are to be done.

6) Thrips : Record the damage on 0-9 scale at seedling and tillering stages of crop growth as detailed below :

- 0 - No damage
- 1 - Rolling of terminal 1/3 area of 1st leaf.
- 3 - Rolling of terminal 1/3 - 1/2 area of 1st and 2nd leaves.
- 5 - Rolling of terminal 1/2 area of 1st, 2nd and 3rd leaves, yellowing of leaf tips.
- 7 - Rolling of entire length of all leaves, pronounced yellowing.
- 9 - Complete plant wilting, followed by severe yellowing and scorching.

7) Any other pests :

Record either pest population/plant or percent damage if pest has caused significant damage. Specify the pest.

Special Instructions :

- 1) Do not apply any insecticide either during nursery or in the main field.
- 2) Specify damage causing pest for each column or observations.
- 3) Report data only against those pests where pressure was moderate or high.

N.B : Record data separately for each of the pests.

DIRECTORATE OF RICE RESEARCH
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Coordinated Entomology Trials, *Kharif* 2011

Name of the trial	:	National Screening Nursery (NSN)
Objective	:	To note the reaction of advanced/initial yield trial entries against insect pests and diseases.
Entries	:	There will be four sets of NSN. NSN-1 , consists of AYT (Advanced Yield Trials) entries. NSN-2 , consists of IYT (Initial Yield Trials) entries. NSN-(Hills) consists of AYT-hills entries NHSN (Hybrids) consist of IHRT entries
Replications	:	One.
Planting date	:	Adjust time of planting so as to catch up with peak pest pressure.
Spacing	:	20 x 15 cm.
Age of seedlings	:	3 - 3 1/2 weeks.
Seedlings/hill	:	One.
Check variety	:	TN 1
Plot size	:	Each entry one row of 20 hills.
Fertilizer	:	Apply fertilizers according to local recommendations to get higher yields (more N may be top dressed to get higher infestation).

Observations :

- 1) Record observations on two major pests only.
- 2) Refer instruction sheets of earlier trials viz., PHS, GMS, GEMP and MRST for detailed guidelines to record pest incidence/damage.
- 3) Entries may be scored on 0-9 scale as per Standard Evaluation System of IRRI, Philippines.

N.B : Record data separately for each of the pests and indicate clearly units of observation, pest involved and time of recording data.

Special Instructions :

Do not apply any insecticide either during nursery or in the main field.

DIRECTORATE OF RICE RESEARCH
RAJENDRANAGAR, HYDERABAD - 500 030.

Coordinated Entomology Trials, Kharif 2011

Name of the trial	:	Gall Midge Biotype Monitoring Trial (GMBT)
Objectives	:	To monitor prevalence, distribution and occurrence of gall midge biotypes within the country.
Differentials	:	As per list to be enclosed along with the seeds.
No. of plantings	:	Late planting to catch up the maximum infestation.
Plot size	:	1 row of 20 hills per variety.
Spacing	:	15 x 15 cm.
Age of seedlings	:	3 - 3 1/2 weeks
Seedlings/hill	:	One
Fertilizer	:	Apply fertilizers according to local recommended practice for obtaining high yields (more N may be top-dressed to get higher infestation).

- Observations** : 1) At 30 and 50 DAT, examine all plants to report total number of plants and gall midge damaged plants.
- 2) Also record from a maximum of 10 damaged plants the number of total tillers and silver shoots.

Special Instructions :

1. Seed should be collected separately from each culture which showed nil incidence of gall midge. Seed should be sent to the Principal Scientist & Head, Department of Entomology, Directorate of Rice Research, Rajendranagar, Hyderabad - 500 030, A.P.
2. No insecticide should be applied in this trial.
3. No weedicide should be applied in this trial.
5. In case pest population build-up is seen during post-tillering stage, induce fresh tillering in 50% of hills of each entry by cutting the tillers at water level and record the damage at peak damage.

DIRECTORATE OF RICE RESEARCH
RAJENDRANAGAR, HYDERABAD - 500 030.

Coordinated Entomology Trials, Kharif 2011

Name of the trial	:	Gall Midge Population Monitoring (GMPM)
Objectives	:	To monitor the virulence pattern of gall midge population against select donors.
Differentials	:	1. Purple variety (S. Check) 2. Kavya with <i>Gm1</i> gene for resistance 3. Aganni with unknown gene 4. Abhaya with <i>Gm4</i>

Note: Differentials may be selected based on the region

Experimental Procedure :

1. Raise nurseries of the differentials (in plastic/GI trays of suitable size) 2 weeks prior to anticipated peak population of gall midge at your location.
2. When seedlings are 1 week old transplant them to about 250 small plastic/clay pots of about 10 cm diameter and 8-10 cm height holding 500 gm soil. Each pot should have 4 hills and each hill with 5 seedlings. Each hill in a pot represents one variety. Label each hill in all the 250 pots. You need 1000 labels. Plant each variety – at predetermined equidistance spots in clockwise order of Purple, Kavya, Aganni and Abhaya (Fig. 1)
3. Take precautions to protect the plants from natural infestation by gall midge by keeping the pots in a net house or in well lighted cages. Avoid exposing plants to electric light source during night times.
4. On the day of infestation, cover each pot with a clear plastic bag (available in any general store). Each bag should just fit the pot at the upper rim. You may use a rubber band or thread to tie, if necessary. Height of bag should be at least 15-20 cm to leave enough space above the plants.
5. Plants should be at least 2 week old and/or of three leaf stage on the day of infestation.
6. To infest each pot, collect one female insect at a light point located near any GM infested plot on the farm. Insects can be collected more easily during peak infestation period between 7.00 to 9.00 pm. Release the insect on to the pot in the bag through a small slit. Care must be taken to infest each pot with one female only and seal the slit to prevent escape of the insect.

7. To facilitate infestation of all 250 pots on one day, transport the pots covered with transparent plastic bags to the collection site in the evening itself. Use an appropriate aspirator to collect insect by gently sucking into the tube and then release it through the slit into the bag by gently blowing out.
8. Keep the infested pots covered with plastic bag back in the net house/cage for two days. On third day remove the bags, water the plants and provide extra humidity for two more days for egg hatching and maggot establishment. This can be done by a humidifier or by periodic (every 30 mins.) spraying of water using a clean plastic atomizer. Alternatively, keep the pots covered with new plastic bag for one more day after watering the pots.
9. Plants are taken care for 3 more weeks until galls develop.

Data recording:

1. When differentials in all the pots show galls, record for each pot, number of gall midge damaged plants for each of the differentials. Record number of galls in Purple variety, Kavya, Aganni, and Abhaya.
2. Record sex of the insect emerging from galls for each pot. This can be best done by again covering the pots having silver shoots with the polythelene sheet prior to adult emergence and noting the sex of emerging insect. Alternative is to examine the puparium left in the gall exit hole under binocular microscope. Female puparium is slightly larger than the male puparium Fig. 2. Generally, if each pot is infested by a single female, all the emerging insects from a pot will be of one sex. Hence, noting the sex for the first few emerging insects will be good enough.
3. Report data in the following format :

Pot No.	No. of galls in				Sex of emerging adults
	Purple variety	Kavya	Aganni	Abhaya	
1					
2					
.					
.					
250					

Seed supply: 100 gm of seeds of each differential is being supplied to the concerned centres viz., Warangal, Raipur, Cuttack, Jagtial and Moncompu.

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Coordinated Entomology Trials, *Kharif* 2011

Name of the trial	: Insecticide Evaluation Trial (IET)
Objectives	: To study the effectiveness of promising and new insecticides against major insect pests.
Variety	: Any susceptible high yielding variety.
Layout	: Randomized Block Design.
Treatments	: Eight
Replications	: Three
Plot size	: 20 - 25 Sq.m
Spacing	: 20 x 15 cm.
Seedlings/hill	: Two.
Age of seedlings at planting	: 3 1/2 - 4 weeks
Time of planting	: Adjust planting time so as to catch peak incidence of insect pests for exposure to insecticide application.
Fertilizer	: As per the recommendations for specific area to obtain maximum yields.
Insecticides	: As per the list.
Insecticidal applications	: 1. At all locations one application of chemicals should be made at 15 DAT. Subsequent applications of chemicals should be made as and when the insect population/damage reaches economic threshold level. 2. In case stem borer damage is expected at heading stage, one application of all chemicals should be made just before boot leaf stage. In case of spray formulations repeat the application one week later.

Observations :

1. Survey insect populations in experimental plots as well as at light trap at 10 days intervals to judge the time of insecticide application.
2. Silver shoot/dead heart counts on 20 plants based on stratified random sampling should be recorded at 15 days after each application along with total tillers. Follow the same method for white ears at the time of harvest along with total productive tillers.
3. a) Record populations one day before and 3 days after each application in case of external feeders like leafhoppers, planthoppers and hispa on ten random plants.

b) In each plot select 10 random plants and record damaged leaves and total leaves one day before and 10 days after each application.
 - i) Leaf folder, ii) Whorl maggot,
 - iii) Rice hispa, iv) Other insect pests.
c) Record insect population on 10 hills if ear head bug (gundhi bug) appears in considerable numbers. Also record percent damaged grains.
4. Phytotoxicity if any may be recorded and intimated.
5. Data on natural enemies in 10 hills may be recorded and reported in appropriate format.

Yield data:

Grain yields should be collected from each plot. Exclude 2 border rows on all sides. Mention net plot size and report the yields as Kg/plot.

Special Instructions :

1. Nursery should be protected from insect pests by applying suitable insecticidal spray at 0.5 kg a.i. /ha as and when needed.
2. Individual plots should be separated by bunds and channels to regulate water flow and prevent water movement from one plot to other. Maintain not more than 5-7 cm of water in experimental plots.
3. Efforts should be made to prevent drift between treatments while spraying.
4. Spraying should be done to provide full coverage.

5. In case of direct seeding the experimental plot may be laid out according to the design before seeding. Ensure uniform plant population in all plots.

Details of treatments in Insecticide Evaluation Trial (IET), *kharif* 20101

S. No.	Trade Name	Common Name	% a.i. formulation	g or ml of formulation/ha
1.	Sutathion	Triazophos	40	750
2.	Sutathion	Triazophos	40	1250
3.	Hostathion	Triazophos	40	750
4.	Hostathion	Triazophos	40	1250
5.	-	Sulfoxaflor	24	313
6.	-	Sulfoxaflor	24	375
7.	Sufos	Monocrotophos	36	1390
8.	Untreated control	-	-	Water spray

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Coordinated Entomology Trials, *Kharif* 2011

Name of the trial	:	Pesticide Compatibility Trial (PCT).
Objectives	:	To evaluate the compatibility of selected insecticides and fungicides as tank mix as reflected by their effectiveness against target pests under field conditions.
Variety	:	Any susceptible high yielding variety.
Layout	:	Randomized Block Design
Treatments	:	Nine
Replications	:	Three
Plot size	:	20 – 25 sq.m.
Spacing	:	20 x 15 cm.
Seedling/hill	:	Two.
Age of seedlings at planting	:	3½ - 4 weeks
Time of planting	:	Adjust planting time so as to catch peak incidence of target insect pests and diseases to judge the effectiveness of the treatments.
Target insect pests and diseases	:	Leaf folder, stem borer, planthoppers, blast and sheath blight
Fertilizer	:	As per recommendations for specific area to obtain maximum yields.
Treatments	:	As per the list attached.
Spray volume	:	Spray fluid @ 500 litres/ha has to be used for all the treatments.
Time of pesticidal applications	:	In areas where leaf folder / stem borer and blast are problems, one application of all the treatments should be given at 15 DAT. Subsequently, two applications of all the treatments should be made at 15 days interval when leaf folder / stem borer

reach ETL (5% DH or 2 damaged leaves/hill) and / or blast appears initially or at 1% disease severity level.

In areas where BPH and sheath blight are problems, all the treatments should be applied thrice at 15 days interval when BPH/WBPH reach ETL (5-10 insects/hill) and/or sheath blight appears at 5% disease severity level.

One application of all the treatments should be made at panicle formation stage to judge their effectiveness against white ear and neck blast damage.

If the infestation of leaf folder / stem borer and blast **OR** planthoppers and sheath blight persist in high intensity, additional application of all the treatments can be made depending on the necessity.

Observations:

1. Survey insect populations and / or disease incidence in experimental plots at weekly intervals from 10 DAT to judge proper time of application of the treatments.
2. Record damage by leaf folder on 10 randomly selected hills/plot at 1 day before and 8 days after application of the treatments each time.
3. Record total tillers and dead hearts on 10 random hills/plot to assess stem borer damage.
4. Record population of BPH/WBPH on 10 randomly selected hills/plot at 1 day and 5 days after application of the treatments each time.
5. Percentage disease severity of blast has to be recorded 1 day before and 10 days after each application of treatments.
6. Percentage disease severity of sheath blight has to be recorded 1 day before and 10 days after each application of the treatments.
7. Observations on white ears and panicle bearing tillers on 10 random hills can be recorded prior to harvest.
8. If other insect pests and / or diseases are prevalent in high magnitude then, suitable observations as indicated in Insecticide Evaluation Trial (IET) may be recorded and intimated.

Yield data:

Grain yields should be collected from each plot excluding 2 border rows on all sides. Mention net plot size and report the yields as kg/plot.

Special instructions:

1. Individual plots should be separated by bunds and channels to regulate water flow and prevent water movement from one plot to other.
2. Efforts should be made to prevent drift between treatments while spraying.
3. Spraying should be done to provide full coverage.
4. In case of direct seeding, the experimental plot may be laid out according to the design before seeding. Ensure uniform plant population in all plots.
5. Help of local plant pathologist can be sought while recording disease severity observations.

Details of treatments in Pesticide Compatibility trial (PCT), *kharif* 2010.

S. No	Trade Name	Common Name	% a.i. formulation	g or ml per litre of spray fluid
1.	Acephate 95 SG	Acephate	95	1.2
2.	Token 20 SG	Dinotefuran	20	0.4
3.	Contaf 5 SC	Hexaconazole	5	2.0
4.	Baan 75 WP	Tricyclazole	75	0.6
5.	Acephate+Contaf	Acephate + Hexaconazole	-	1.2+2.0
6.	Acephate+ Baan	Acephate + Tricyclazole	-	1.2+0.6
7.	Token+ Contaf	Dinotefuran +Hexaconazole	-	0.4+2.0
8.	Token + Baan	Dinotefuran+ Tricyclazole	-	0.4+0.6
9.	Untreated control		-	Water spray

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Coordinated Entomology Trials, Kharif 2011

- Name of the trial : **Influence of rice cultivation systems on pest incidence (IRCP).**
- Objectives : To study the influence of Direct seeded rice on insect pest incidence in hybrids and varieties
- Cultivars : One high yielding rice hybrid and one susceptible popular variety.
- Plot size : A compact block of 4000 sq.m (1 acre) area.
- Treatments : Two main treatments –
 - Standard system of cultivation
 - Direct seeded rice – wet seeding
Two sub-treatments –
 - Hybrid – KRH-2
 - High yielding variety –any local popular variety (Specify)
- Design : The entire area will be divided into seven blocks each representing a replication. In each block, there will be two main treatments each with two sub-treatments viz., one rice hybrid and one high yielding rice variety. There will be four plots in each block and a total of 28 plots as per the lay out.
- Details of the treatments : The package of practices to be followed in each system are given below:

Details of treatments	Standard system of rice cultivation	Direct seeded rice –Wet seeding
Seed rate for nursery (kg/ha)	35 – 40	60 – 70
Seedling age (days)	21 – 30	
Seedling/hill	3 – 4	2
Spacing (cm)	20 x 10	20 x 10

Weed control	Herbicides followed by spot weeding	Spraying of Butachlor + Safener @ 1.5 kg ai/ ha or Pretilachlor + safener @ 0.60 kg ai/ ha at 3 days after sowing. At 20 – 25 days after sowing, depending on the weed density, one hand weeding may be done or application of Allmix + Surfactant @ 40 g ai/ ha.
Water management	Keep water level 5 ± 2 cm up to 7 days before harvesting.	Thin film of water should be maintained up to 10 – 15 days after sowing. As crop grows, saturation level can be maintained.
Nutrient management	Compost is used along with recommended chemical fertilizers depending upon the soil fertility.	Location specific recommended fertilizer doses should be applied.

Note:

- i.** Land preparation for wet seeding is similar to that for transplanting, except that good leveling will ensure good germination and adequate plant stand establishment.
- ii.** Good quality seed of suitable variety is soaked for 24 hours in water and incubated for 24 hours for getting desirable sprouts. Just sprouted seed is dibbled in lines.
- iii.** The sprouted seed should be sown only after draining excess water if any, in the field.
- iv.** Thinning should be done after 10 – 15 days after sowing and care should be taken to maintain intra row spacing of 10 cm.
- v.** No application of any insecticide/fungicide/other pesticide to be given during the crop season.
- vi.** Date of sowing should be same in both the systems. (The same day when seeds are soaked for nursery, seeds should be soaked for direct seeding also).
- vii.** Same hybrid (KRH2) should be grown at all locations and HYV can be any popular variety of that location.

Observations:

Select and mark 10 hills randomly in each plot and record observations as given below:

- i) Count a) Total tillers; b) Total leaves.
- ii) Also, record following injuries :
 - a) No. of damaged leaves (for - hispa, whorl maggot, thrips, leaf folder, cutworm Caseworm & mite).
 - b) No. of tillers with galls (gall midge)
 - c) No. of dead hearts (stem borer).
 - g) No. of white ear heads (stem borer)
 - h) No. of stems cut (rats).
- iii. In case of BPH/WBPH endemic areas, count of their populations on each hill.

Note: Observations are to be recorded at 10 day intervals starting from 15 days of transplanting/ sowing.

- iv. At harvest, record :
 - a) No. of panicle bearing tillers
 - b) No. of white ear heads
 - c) Total no. of grains
 - d) No. of grains damaged (gundhi bug and birds).
 - e) Grain weight per marked hill using the following formula.

Grain wt. per hill = $(100 - MC)/86) \times W$
Where MC : moisture content (%) of the grains
W: weight of all harvested grains from one hill.

- f) Plot-wise yields are also to be recorded after removing the two border rows and marked hills

It is very important and necessary to consult the local Agronomist at different stages of the experiment

Experimental lay out for IRCP trial

R1	R2	R3	R4	R5	R6	R7
S1V1	S1V2	S1V1	S1V2	S1V1	S1V2	S1V1
S1V2	S1V1	S1V2	S1V1	S1V2	S1V1	S1V2
S2V1	S2V2	S2V1	S2V2	S2V1	S2V2	S2V1
S2V2	S2V1	S2V2	S2V1	S2V2	S2V1	S2V2

R – Replication; S1 – system 1 (normal system of cultivation);

S2 – system 2 (Direct seeded rice); V1 – hybrid; V2 – high yielding variety

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Name of the Trial : Trap Crop for Stem borer Management (TCSB)

Objective : To minimize the damage by yellow stem borer (YSB) in the main crop by planting a trap crop.

Principle : Pusa Basmati 1, an aromatic fine grained rice variety attracts ovipositing yellow stem borer moths more than other non-aromatic varieties. This phenomenon may be used to divert YSB from the main crop to reduce damage.

Main crop variety : Local popular variety of your choice

Trap crop Variety : Pusa Basmati 1

Target Pest : Yellow stem borer

Note:

1. The sowing time of the trap crop (Pusa Basmati 1) should be adjusted such that the trap crop flowers one week before flowering of the main crop.
2. When transplanting trap crop with main crop, plant one row of trap crop for every 9 rows of main crop (2.5-3m) in **east-west** direction.
3. Care must be taken to transplant a healthy nursery. Ensure that there is no carry over of stem borer infestation from nursery to main field.
4. Only when the dead heart damage exceeds 20% in the trap crop, a spray of insecticide is recommended for treatments T3 and T4.
5. Since the trial is for stem borer management, incidence of other pests/diseases (only if severe) may be noted.

Treatments

T1- Main crop alone

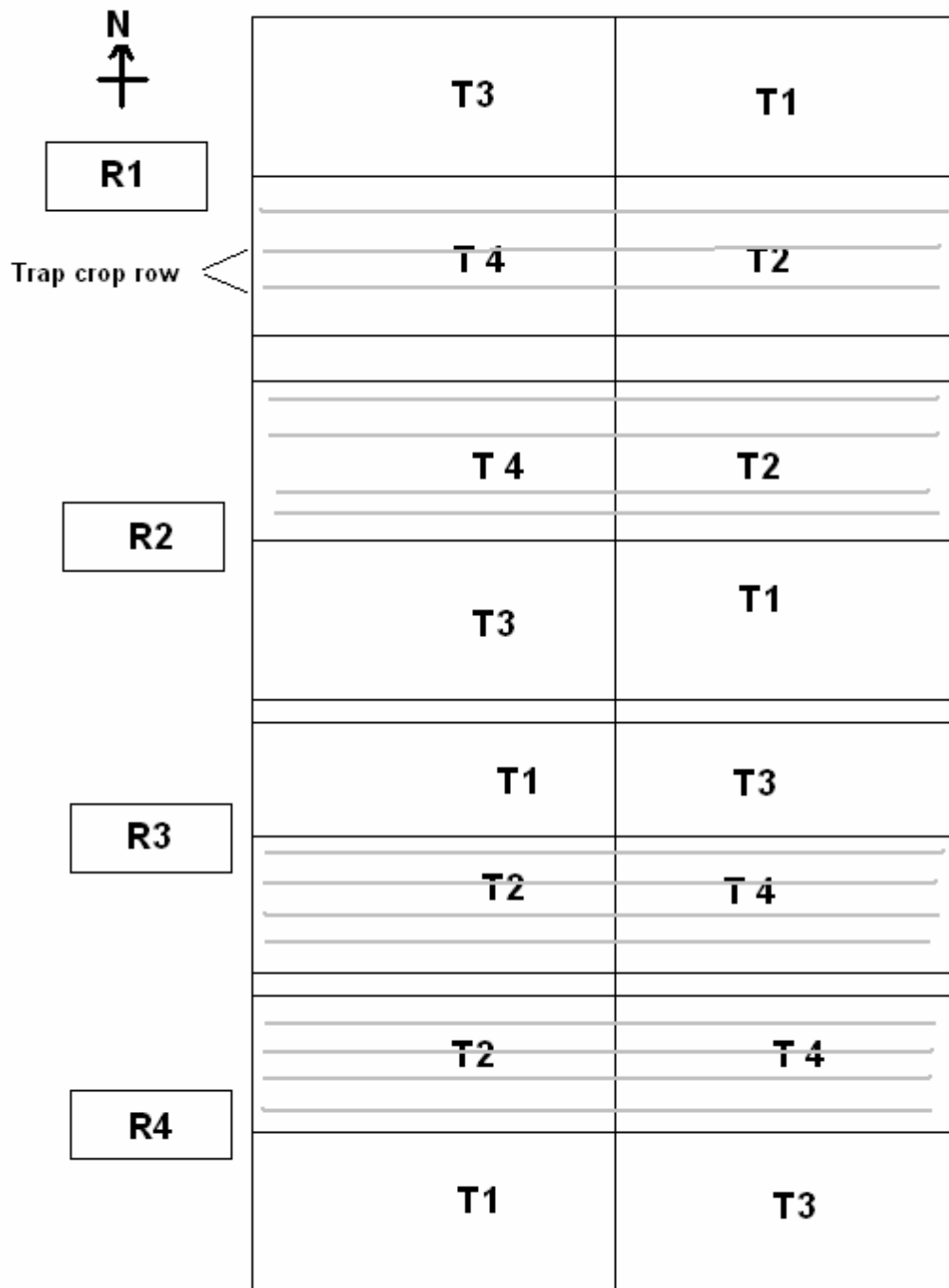
T2- Main crop with trap crop

T3- Main crop with need based insecticide application

T4- Main crop +trap crop with need based insecticide application.

Experimental design : RBD **Replications :** Four

Lay out



Agronomic Practices:

Planting of main crop and trap crop should be done at the same time.
All normal local agronomic practices to be followed.

Observations to be recorded:

a)Vegetative stage: (At 30 DAT and 50 DAT)

- **T1 and T3**-Total tillers, dead hearts in 25 hills per replication
- **T2 and T4** – Total tillers, dead hearts in 25 hills per replication + 25 hills in trap crop per replication. (Count must be taken at random in each line of trap crop)
- Record parasitism at egg stage – Collect 10 egg masses in each replication and observe for egg mass parasitism.

b) Pre harvest count:

- **T1 and T3**-Total tillers, ear bearing tillers and white ears in 25 hills per replication
- **T2 and T4** – Total tillers, ear bearing tillers and white ears in 25 hills per replication in main crop + 25 hills per replication in trap crop (Count must be taken at random in each line of trap crop)
- Mark three areas of one square metre each per replication and count the number of white ears also.

c) Post harvest observations:

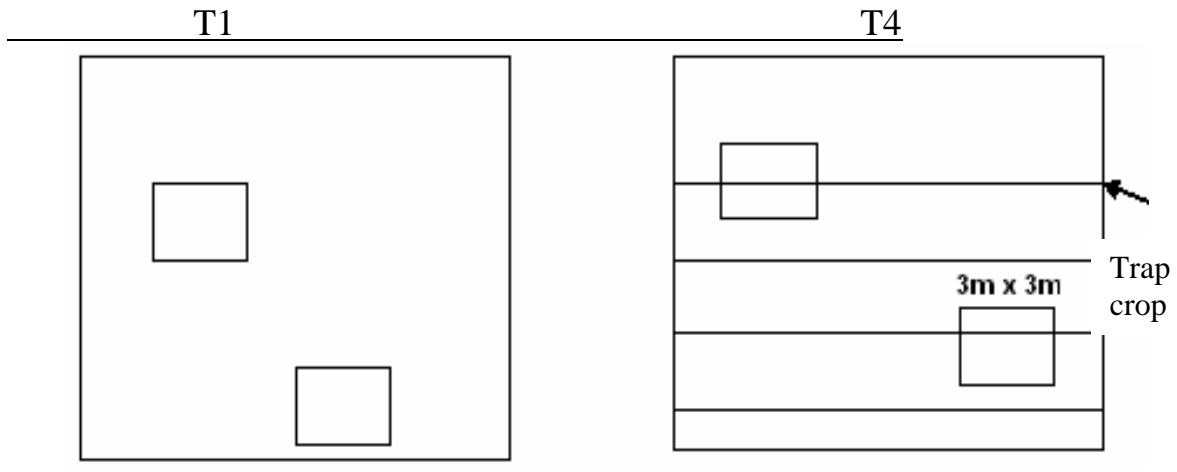
- Dissect 10 stubbles at random in each replication immediately after the harvest and record the surviving number of larvae/pupae on both main crop and trap crop.

d) Cost of cultivation particulars: Note down costs incurred for each field operation for calculating the cost of cultivation for each treatment. Specify all the operations and cost incurred ..

e) Grain yield data: Crop cuts

- In each replication, record grain yield from a uniform area of 3X 3sq m. at two places.
- In the same area before cutting record the absolute number of white ears also.
- Indicate the number of white ears in main crop and trap crop separately.

Example



Note:

- In the treatments T1 and T3, the crop cut involves only main crop in an area of 3 X 3 m, at two places.
- In T2 and T4, where we have both main crop and trap crop, the crop cut area of 3 X 3m covers both main and trap crop. Hence, yield from both have to be taken here. (as shown in the above example)

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Coordinated Entomology Trials, Kharif 2011

Name of the trial :	Yield loss estimation trial (YLET)
Objective :	<ul style="list-style-type: none">• To study the effect of different damage/ pest levels at different stages of crop growth on grain yield.• To know the effect of protection at different stages of crop growth on pest incidence and grain yield.
Variety :	Any high yielding susceptible medium duration (135-140 days) variety
Spacing :	20 x 15 cm
Seedlings per hill :	Two
Age of seedlings at planting:	3½ - 4 weeks
Time of planting :	Adjust planting time to catch peak incidence of insect pest incidence in the area
Treatments :	FIVE (5) treatments The treatments will be : T1 = No protection in nursery and main field (untreated control) T2 = Application of Imidacloprid @ 50 g ai/ ha at 25 & 40 DAT T3 = Application of Phorate @ 500 g ai/ ha at 25 & 40 DAT T4 = Application of 200 kg N/ ha (Based on plot size, calculate and apply) T5 = Augmentation by releases (For augmentative releases, please follow instructions given below)
Replications :	4
Design :	RBD
Plot size:	20 sq.m

Note:

i) No insecticide should be applied in any of the treatments either in nursery or main field. However, suitable fungicide may be applied at recommended dose in case of occurrence of any fungal disease in severe form

Insects identified for release & Procedure to be followed:

Leaf folder - Aduthurai, Jagdalpur, Puducherry.

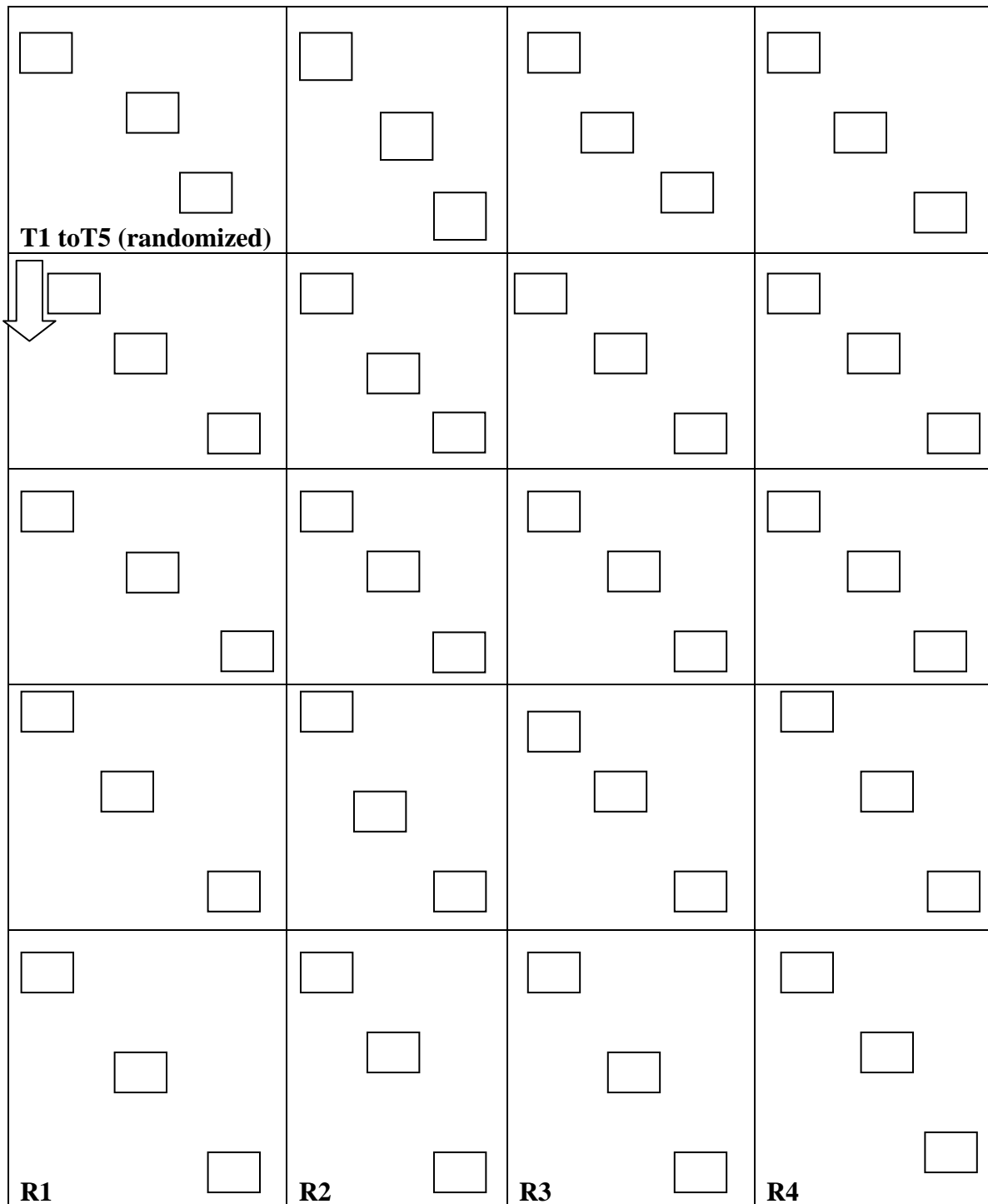
Augmentation: In case of leaf folder cover each square meter area with a nylon net and release 10 pairs of adult leaf folder moths (OR) release 10 larvae / sq.m at 25 & Panicle initiation (PI) stage.

Stem borer – Ghaghraghat, Chinsurah, Ludhiana, Sambalpur, Titabar

Augmentation: Pin 1 egg mass / square meter (OR) release neonate larvae @ 2 per tiller at 25 DAT & booting stage.

Observations	<p>In Main field:</p> <ul style="list-style-type: none">• Mark one square meter area in each plot at 3 places as given in lay out• Record observations 2 times i.e., at 65 DAT & booting stage incase of leaf folder and at 50 DAT & pre-harvest in case of stem borer.• At each observation, in marked areas, count number of dead hearts/ sq.m, number of damaged leaves / sq.m, number of white ears / sq.m. Also at the same time, select 5 hills at random and count total tillers, total leaves and panicle bearing tillers from each marked area.• Also record other pests if present in the marked area viz., number of galls / sq.m or no. of BPH/ WBPH/ GLH etc• Record yield in each marked square meter area• Also record grain yield separately in each plot. Exclude two border rows on all sides and two marked areas.
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LAYOUT PLAN FOR ESTIMATION OF YIELD LOSSES DUE TO INSECT PESTS (YLET), KHARIF 2011



R1 - R4 = Replications

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Coordinated Entomology Trials, Kharif 2011

Name of the trial	:	Monitoring of pests and their natural enemies (MPNE)
Objectives	:	<ul style="list-style-type: none">• To study the dynamics of pest species composition• To observe the key natural enemies of major pests
Variety	:	Any susceptible high yielding variety
Plot Size	:	A compact block of 2000 Sq.m. area.
Spacing	:	20X15 cm
Seedlings/hill	:	Two
Age of seedlings at planting	:	3 1/2 to 4 weeks
Time of planting	:	Adjust planting time so as to catch peak incidence of insect pests and their natural enemies in the experimental field throughout the crop season
Fertilizer	:	As per recommended package of practices specific to each location
Insecticides	:	No application of any insecticide/fungicide/other pesticide to be given during the crop season. However, in one block for planthopper observation protection may be given as per farmers practice.
Methodology for layout	:	Divide the entire plot into 4 blocks of equal size and demarcate the blocks with bunds and channels and label them as block 1, 2, 3 and 4. In each block select 10 hills at random for observation Ensure that the entire field is planted with the same variety and exposed to the same farm practices.
Observations	:	Concentrate on any one or two major pests in your area and investigate thoroughly. Centers for each pest are suggested
Planthoppers	:	The following observations should be recorded at fortnightly interval
<i>Centers:</i>		
Nellore, Maruter		BPH: WBPH ratio
Coimbatore		Nymphs and adults of (No./hill)
Gangavathi		Brown planthopper – <i>Nilaparvata lugens</i> Stal
Chinsurah		Whitebacked planthopper – <i>Sogatella furcifera</i>
Ludhiana		
Kaul		Predators (No./Hill)
Malan		Counts of natural enemy population as listed below
New Delhi		Green mirid bugs (<i>Cyrtorhinus lividipennis</i>) brown mirid bug (<i>Tytthus parviceps</i>) Spiders (identify genus) Coccinellids (grubs and adults) Staphylinid beetles

Egg parasitisation

Oviposited stalks/stems have a whitish patch from which they can be identified. Cut 25 stalks every fortnight and dissect them under a microscope for observing parasitized eggs. Unparasitised eggs are creamy white while parasitised eggs are lemon yellow or orange red in colour based on the species of parasitoid. (Fig. *)

Alternatively, the cut stems can be placed on moist filter paper for emergence of egg parasitoids such as *Anagrus*, *Oligosita* and *Gonatoceros* or nymphal emergence. Calculate % parasitism on egg basis (Number of eggs parasitized to the total eggs in an egg mass). The total number of egg masses observed should be 100 or more over a season. Record the species of parasitoids and ratio observed.

Nymphal parasitisation

Percentage of nymphs showing drynid parasitisation (carrying grub sac on the body) at fortnightly intervals and number of Dryniid adults (*Haplogonatopus* sp) which look like big black ants (Fig*), the counts being taken along with the predators number above

Ecological engineering

- The area designated for observations should be divided into four blocks as mentioned above
- One part should be left untreated (blocks 1)
- Farmers' practice (with plant protection- block 2)
- Ecologically engineered plots (blocks 3 & 4) will have –
 - (i) organic amendment
 - (ii) Alleyways
 - (iii) Mid season draining of water

Stem borers

Centres:
Rajendranagar,
Karjat,
Rewa,
Pantnagar,
Ghaghrahat,
Patna,
Pusa,
Titabar,
Chisurah
Bankura,
Ludhiana
New Delhi

: Species composition

- Monitor the selected area at least thrice *viz.*, tillering stage, maximum tillering stage and heading stage, during the crop season.
- Dissect open each affected tiller (dead heart/white ear) and observe the type of stem borer larva/pupa in the tiller. Note down the number of the larvae of each type *i.e.*, pink stem borer, white stem borer, yellow stem borer, striped stem borer etc. in at least 50 dead hearts at each observation

Egg Parasitism

At fortnightly intervals collect stem borer egg masses based on availability ranging from 10 to 25 from

unsprayed plot and keep them singly in test tubes. In locations where more than one species is prevalent the egg masses of the different stem borers should be collected separately and observed for parasitisation. Observe for the emergence of adult parasitoids. After emergence of the parasitoids adults may be observed under microscope to identify the species and the respective number. Based on number of larvae emerging and parasitoid emergence the per cent egg parasitism can be calculated. The number of egg masses parasitized of the total egg masses observed should also be given for every fortnight

Gall midge : Collect 25 -50 galls based on infestation at fortnightly intervals and observe for parasitized galls. The healthy galls will differ from parasitized galls in that the latter is more swollen than the former. The emergence holes are large and oval in case of healthy galls, often with puparia. Parasitised galls have small circular holes without puparia. Calculate % parasitism on total number of silver shoots observed and number parasitized.

Centers : Warangal,
Ragolu,
Sambalpur,
Raipur,
Iroisemba,

The un-emerged parasitized galls should be placed in test tubes singly and observed for emergence and identify parasite species based on adult appearance.

Leaf Folder : • Monitor the selected area at fortnightly intervals during the crop season.
• Hills with leaf folder damaged/folded leaves should be observed for the type of leaf folder larva. Collect 25 larvae each time and classify them into respective species
• The adults of leaf folders should be collected by sweeping and dropping into a poison bottle/ or container with ethyl acetate. In the laboratory the adults should be separated into species and the number recorded as a percentage of total moths observed.

Centers:
Aduthurai,
Coimbatore,
Raipur,
Nawagam,
Karaikal

Larval Parasitisation

The following observations should be recorded at 14 day intervals

Collect 25 larvae at 15 day intervals and rear in laboratory. Observe the number of parasitoids emerging and per cent parasitized larvae

Collect 25 leaf folder pupae from field and keep them singly in test tubes and observe for the emergence of parasitoids. Identify and record the number and per cent parasitization.

**Gundhibug/
Earhead bugs**

Centres: optional
based on incidence
of the pest

- Monitor the selected area at panicle initiation stage till harvest
- Collect earhead bugs by sweep net or by bagging
- 10 sweeps each at 5 locations at each observation date and three times per season should be done
- If bagging is done bugs should be shaken into individual polythene bags from 50 - 100 earheads at each observation
- Identify them with the help of a microscope in the laboratory and record the number observed for each species

Egg parasitism

The bug egg masses can be observed in the field for parasitisation. Healthy eggs are pearly white in colour while parasitized eggs turn black. The percent parasitism should be recorded at least three times in a season from panicle initiation. Blackened eggs should be collected and placed in vials in the laboratory for parasitoid emergence and identification

Note: * Try to identify parasitoids and predators based on illustration given in the publication by Katti et al. 2008 “Biological control of insect pests of Rice”.
Request for a PDF copy by e-mail.

You may send specimen preserved in alcohol to Dr. Chitra Shanker, Senior Scientist, DRR, Hyderabad for identification.

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RAJENDRANAGAR, HYDERABAD-500030.

Coordinated Entomology Trials, Kharif 2011

Name of the trial	:	Ecological Engineering for Planthopper Management (EPM)
Objectives	:	<ul style="list-style-type: none">• To use ecological methods to manage planthopper pests
Variety	:	Any susceptible high yielding variety
Plot Size	:	A compact block of 1000 Sq.m. area. for each treatment
Treatments	:	1) EEP 2) Farmers Practice
Spacing	:	20X20 cm for EEP and 15 X 15 for FP
Seedlings/hill	:	Two
Age of seedlings at planting	:	3 1/2 to 4 weeks
Time of planting	:	Adjust planting time so as to catch peak incidence of insect pests
Fertilizer	:	For FP: As per recommended package of practices specific to each location For EEP : Not to exceed 100 Kg N, others as above
Insecticides	:	For EEP : No application of any insecticide/fungicide/other pesticide to be given during the crop season. For FP : Need based application of suitable insecticides.
Methodology for layout	:	Divide the entire block into 5 sub-blocks of equal size and demarcate the EEP blocks with alley ways (one skip row) at every 2 m distance. For FP, sub-blocks are demarcated by pegs. Each sub-block will be one replication for observations.
EE interventions	:	<ul style="list-style-type: none">• Increasing floral diversity through locally available flowering weeds/ bund crops that can be a good nectar source. White and Yellow flowers of compositae are reported to attract more wasps. Some plant species recommended are Weeds: <i>Tridax procumbens</i>, <i>Aster</i> sp., or any Asteraceae locally available Crops: (<i>Coriandrum sativum</i>), sesamum (<i>Sesamum indicum</i>), or some pulse• Place left over seedlings in a small bucket covered with mesh to prevent hoppers moving out while letting egg parasitoids move into field• Augment mirids from adjoining area
Observations	:	1. Visual counts of hoppers on 10 hills/sub-block at 10 days interval

2. Counts of mirid predators – both nymphs and adults on these hills
3. Drynid parasitisation based on cocoon count
4. Egg flagging for studying egg parasitisation: Potted plants containing freshly laid planthopper eggs are placed in field for three days and brought back to the laboratory for noting egg parasitoids. The tillers with eggs should be placed on moist filter paper in petri plates for parasitoid emergence or alternatively, examine one tiller per hill for egg parasite emergence hole and report number per tiller per replication.
5. If hopper damage is seen, score each subblock on 0-9 scale or report percent plant mortality.

Please send specimens preserved in alcohol of all parasitoids collected to Dr. Chitra Shanker, Senior Scientist, DRR, Hyderabad for confirmation and identification. It is mandatory that you send all egg parasitoids collected from stem borer egg masses pooled into one sample for maintaining a repository at DRR. Centres reporting on stem borer species other than YSB and PSB are also required to send specimens of the collected stem borer species.

DIRECTORATE OF RICE RESEARCH
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Coordinated Entomology Trials, *Kharif* 2011

Name of the Trial Objective	Integrated Pest Management (Special) To validate IPM practices from a basket of options available and demonstrate to farmers the management of pests in a holistic way (including insects, diseases and weeds).
Variety	Local popular variety of the region
Plot size	Two blocks of not less than 2000 sq.m for each block
Treatments	Two treatments. i) IPM ii) farmers practices (FP)
Details of the treatments	The package of practices to be followed in each block are given below:

Details of treatments	IPM block	FP block
Nursery	<ul style="list-style-type: none"> • Seed treatment with Carbandezim @ 10 g for 10 kg seeds (wet seed treatment). Soak these treated seed overnight in 10 liter water and keep in gunny bag for germination (see attached detailed instructions) • Apply Carbofuran @ 1.1 kg a.i./ ha, 5 days before pulling seedlings from nursery for transplantation. 	As per the local farmers practice
Main field	<ul style="list-style-type: none"> • Transplant seedlings at a spacing of 20 x 15 cm. • Leave alleyways of 30 cm after every 2 m / 10 rows. • Fertilizers applied should not exceed local recommended fertilizer dose. • Apply Butachlor 1.5 kg a.i./ ha within one week 	

	<p>after transplantation.</p> <ul style="list-style-type: none"> • Take observations starting from 15 DAT at 10 day interval. • If BLB comes between 20 to 30 DAT, split doses of nitrogen will be delayed, particularly the second dose. • At 15 DAT, install pheromone traps with 5 mg lure @ 8 traps/ ha for stem borer monitoring. While installing make sure that the trap remains above the crop canopy. 	
30 – 59DAT	<ul style="list-style-type: none"> • Do one manual weeding at 35 DAT • Observe bund area and if sheath blight observed, go for spray. • N top dressing 	
60 – 90 DAT	<ul style="list-style-type: none"> • One spray of Cartap hydrochloride 50 WP @ 600 g / ha at 60 DAT. • Blanket application of Propiconazole 0.1%. • Mid season drainage should be followed in case of BPH endemic areas. 	
> 90 DAT up to harvest	<ul style="list-style-type: none"> • Mark 5 x 5 m² and take yield, at 5 places in this block • In the same marked 5 x 5 m² area, select 5 hills and take yield attributes (tiller number/ hill, panicle number/ hill, grain number and grain weight etc. 	<ul style="list-style-type: none"> • Mark 5 x 5 m² and take yield, at 5 places in this block • In the same marked 5 x 5 m² area, select 5 hills and take yield attributes (tiller number/ hill, panicle number/ hill, grain number and grain weight etc.

Observations to be recorded:

- Starting from 15 DAT, observations on pest incidence should be recorded on 10 randomly selected hills in each replication (50 hills/ each block) at 10 day interval.
- Record number of tillers damaged by stem borers (DH/WE), gall midge (SS), number of damaged leaves (leaf folder/hispa/case worm), planthoppers, natural enemies, ear cutting caterpillar, ear head bug from the selected hills.

Compute the insect damage as follows:

$$\text{Percent DH, SS} = \frac{\text{Total number of DH/SS from 50 hills}}{50 \times \text{Average number of estimated tillers per hill}} \times 100$$

$$\text{No. of damaged leaves per hill} = \frac{\text{Total number of damaged leaves from 50 hills}}{50 \times \text{Average number of estimated leaf number per hill}}$$

For other pests/natural enemies = Average number per hill to be computed accordingly.

Record disease severity against Blast (leaf/neck), bacterial blight and other major diseases on 0-9 scale.

Record severity of weed infestation on 0-9 scale

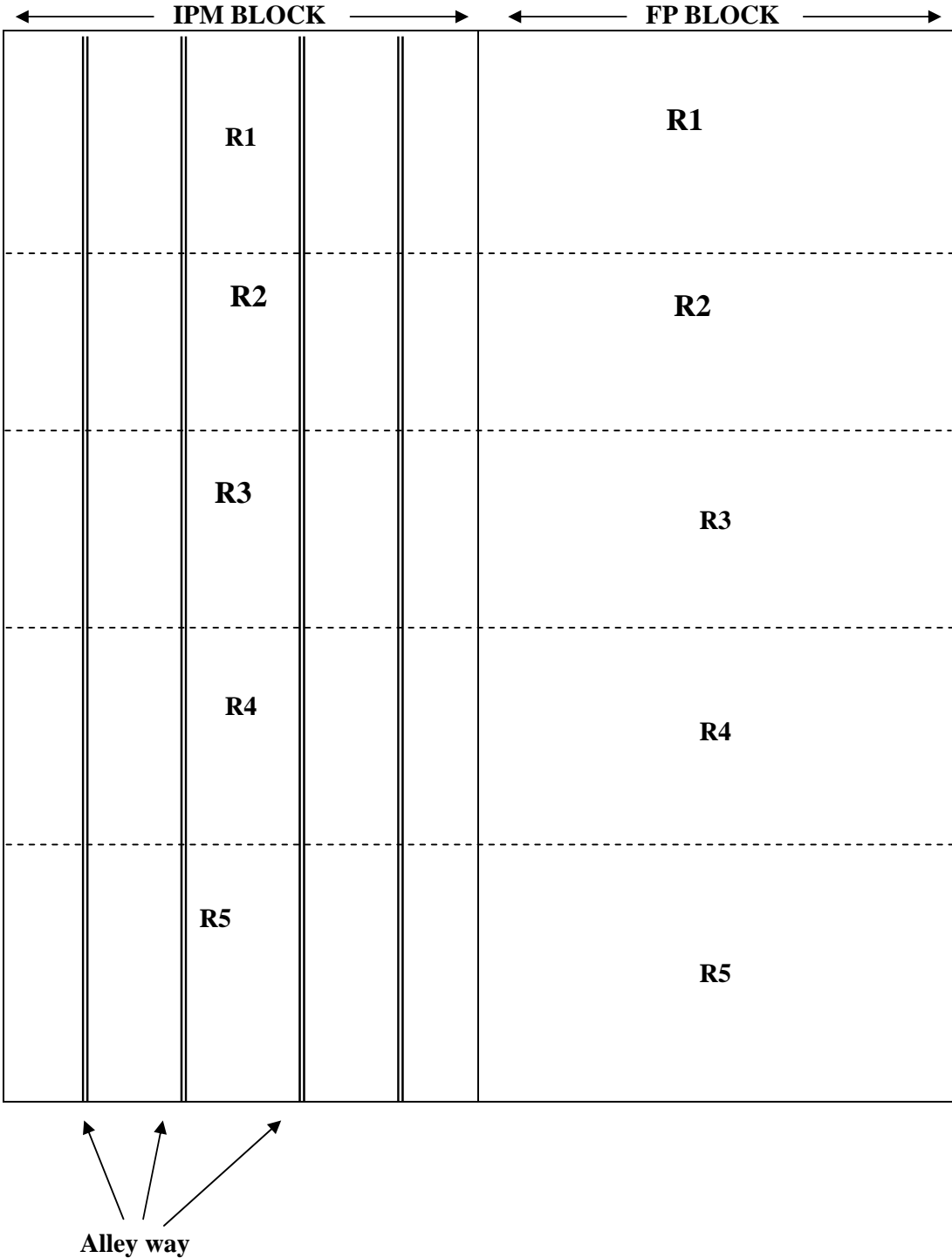
Grain yield : Record the yield from 5 places of 5 x 5m area at each replication.

Note: In case of insect infestation, please follow ETL's and control measures should be taken after consultation with PI.

Economic Thresholds Suggested for need based application of insecticides

- Stem borer : 10 percent dead hearts or one adult moth or one egg mass per sq. m.
- Gall midge : 5 percent silver shoots.
- Leaf folder : 2 caterpillars per hill.
- Planthoppers : 10 insects/hill at vegetative stage
20 insects/hill at later stage.

**LAYOUT PLAN FOR INTEGRATED PEST MANAGEMENT (SPECIAL)
KHARIF 2011**



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Light Trap Collection of Insects (LT)

Objective	: To monitor on long term basis fluctuations in the populations of insect pests and their natural enemies.
Light Trap Design	: Mention the type of light trap installed
Reporting data	No. of insects collected be recorded daily in respect of major insect pests of your region, natural enemies and other insects. Send raw data for processing at the DRR. Mention the insect species clearly.
Additional Information	Report the date of planting of rice crop in the adjacent area of the light trap, specify variety and growth stage for each month.
Important	<ol style="list-style-type: none">1. Light trap data are needed for the entire year though there may be a single rice crop at your centre.2. Mention the prevailing cropping system in the area3. Mention type and wattage of the bulb used



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