

# Proceedings of Benchmark Survey:

Plant Health Problem of Rice: Earthworm (*Chera*)

2003-04 Boro Season

2 March 2004

Venue:

Sonabaju High School

Gurudaspur, Natore



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## **1. Introduction:**

Although rice is the main staple food of Bangladesh the yield of rice per unit area of land is lower compared to other Asian countries. Due to increasing population of this country, the total cropped area is decreasing day by day and there is no scope for bringing new lands under cultivation. To overcome the food problem of this densely populated country, it is essential to produce more food in the specific area of land.

One of the main factors that are responsible to reduce the rice production is the infestation of pests and diseases. About 175 pests have been recorded in Bangladesh that causes the damages of rice plants. Of this, 20-30 species have been found to be more damaging for rice plant. Results of several crop loss estimation trial showed that 18% yield loss due to the infestation of main insect pests.

The environmental condition of Bangladesh is very suitable for disease infestation and their reproduction. About 31 diseases have been identified in Bangladesh that infests the rice crops. The crop loss estimation trial showed that about 10-15% yield loss due to the infestation of main diseases. These diseases are caused by different agents such as, fungus, bacteria, virus and nematodes which are not often visible by naked eyes. So it is necessary to identify the main diseases with their symptoms for proper management.

Farmers have been facing numerous problems in crop production. Even few farmers claimed about the infestation of unknown pests. To identify those constraints a benchmark study is crucially important. Findings of the benchmark survey will serve as baseline information to know the actual situation of insect pest and diseases of crops.

## **2. Objectives:**

The objectives of this benchmark study are as follows:

1. To know more about the local knowledge of plant health problems;
2. To make a good diagnosis of pest and diseases of rice plants;
3. To identify the infestation status of the major pests and diseases of rice plant;
4. To know the existing pest management practices adopted by the farmers and
5. To know more about the newly occurred pests of rice plant.

## **3. Methodology:**

The benchmark survey was conducted by Agricultural Advisory Society (AAS) among the 20 farmers of five villages in two upazilas of Natore districts. The survey was designed with the medium grouped farmers who had engaged directly in crop cultivation. The information was collected in a participatory manner. A total of 27 persons were involved in the survey programme including farmers, researchers and pest specialists. The entire survey programme was divided into four sessions.

### **First Session:**

After registration of the respondents, the objectives of the survey were explained by Mr. Harun-Ar-Rashid, Executive Director, AAS and Dr. Mohbubur Rahman, Professor and Head, Entomology Division, Bangabandhu Sheikh Mujibar Rahman Agricultural University (BSMRAU), Gazipur.

### **Second Session:**

The major pests and diseases of rice plant were identified by the farmers during participatory discussion. The local name, common name, pest status, nature of damage and symptoms of the major pests and diseases of rice were recorded by the survey team. The most damaging pest and newly occurred pests were also identified by the participated farmers during participatory discussion in this session.

### **Third session:**

To know more information about the newly occurred damaging pest, a field visit was made in this session. Farmer's concept on pest characters, nature of damage was recorded and sample collection was done for better diagnosis of the pest. For further research, an experimental field was selected to observe the nature of the pest infestation and its effect on rice yield.

### **Fourth session:**

Farmers expressed their experience about the pest problems and the importance to initiate further research about the newly occurred pest of rice in their low-lying fields.

## **4. Survey Site:**

The benchmark survey on farmers knowledge about major pests and diseases in Boro rice season was conducted in Natore district where Agricultural Advisory Society (AAS) has been implementing a project on plant health service initiative with the association of CAB International, UK. The survey was conducted with 20 farmers of five villages in two upazilas of Natore district. To collect the information's related to pests and diseases of rice plant, the common room of Sonabaju High School, Gurudaspur, was selected as a venue for open discussion among the participants, few fields were visited near the Sonabaju bazar to collect the field information.

## **5. Survey Instruments:**

To collect the information from the farmers about the major pest and disease problems of rice plant, the initial schedule of the survey was made by A.K.M. Murshedur Rahman, Entomologist, AAS. Planning of the survey and the overall support was made by Mr. Harun-Ar-Rashid, Executive Director, AAS. A flip chart was used to record all the farmers' information

## 6. Survey Team:

Two Agronomists and One Entomologist were involved in conduct the benchmark survey, with the 20 farmers of five villages in two upazilas of Natore district. An area coordinator of AAS Natore was assigned to support the survey team. During field visit for collecting more information, a field coordinator of AAS also assigned to support the survey team. A well known scientist, Dr. Mahbubur Rahman, Professor and Head, Department of Entomology, BSMRAU also joined with the survey team to observe the farmers major pest problems at field level. Mr. Harun-Ar-Rashid, Executive Director, AAS was responsible as a team leader of the benchmark survey team.

Members of the survey team were as follows:

SL No.	Name	Position
1	Mr. Harun-Ar-Rashid	Team Leader/Executive Director, AAS
2	Dr. Mahbubur Rahman	Pest Specialist/ Professor and Head, Entomology Division, BSMRAU
3	A.K.M. Murshedur Rahman	Entomologist, AAS
4	Sarker Sabina Yesmin	Agronomist, AAS
5	Abu Reza Masud	Agronomist, AAS
6	Mr. Nurun-Nabi	Area Coordinator, AAS
7	Mr. Abdus Salam	Field Coordinator, AAS

## 7. Respondents Selection:

A total of 20 respondents (farmers) of five villages were participated during the benchmark survey. Out of 20 farmers, four comes from Jhakra village, eight from Sonabaju, two from Sartuspur, four from Ekore and two from Ramkntopur villages. Farmers were selected who have medium sized cultivable land. Farmers practicing cultivation with their own hand were included in the survey where large and landless categories of farmer were carefully avoided. Participated farmers comes from the following villages :

SI No	Village	Union	Upazilla	No of Participants
1	Jhakra	Dharabarisa	Gurudaspur	4
2	Sonabaju	Dharabarisa	Gurudaspur	8
3	Santuspur	Dharabarisa	Gurudaspur	2
4	Ekori	Boraigram	Boraigram	4
5	Ramkantopur	Boraigram	Boraigram	2

## **8. Conducting of Survey:**

### **8.1 Introductory Session:**

After the registration of participants, AKM Murshedur Rahman, Entomologist, AAS introduced the survey team. The objectives of the survey was clarified by Mr. Harun-Ar-Rashid, Executive Director, AAS. The participants introduced themselves at the beginning of the survey programme.

Mr. Harun-Ar-Rashid expressed the hope that the participants would be able to identify the pest problems through participatory discussion and field visit, which is crucially important to initiate the proper management practices.

Dr. Mahbubur Rahman, Professor and Head, department of Entomology, BSMRAU, explained clearly the importance of proper diagnosis of the plant health problems facing by farmers in crop productions.

### **8.2 Information Collection Session:**

The benchmark survey for collecting information related to pest and disease problems of rice plant were divided into two parts.

- I. Information collection by participatory discussion
- II. Information collection by infested field observation.

#### **I. Information collection by participatory discussion:**

The farmers of Jhakra, Sonabaju, Santuspur, Ekori and Ramkantopur identified eight major pests, which cause severe damage to rice plant. On the other hand they identified three diseases, which damage the rice plant. (Please see Table 1)

According to the infestation severity, the pests were ranked chronologically. The survey was aimed to identify the most damaging pest. From the pest ranking, it was found that an unidentified pest causing serious damage to rice plants of boro season in low-lying field, which is locally known as "chera".

The information's collected from the participatory discussion on the newly created pest problem were as follows.

##### **i) Name of the problem:**

Locally the pest was known as "chera poka" The pest is somewhat similar to the earthworm. In the survey area, all species of earthworm was known as "chera". But the pest was smaller and narrower than the earthworm.

##### **ii) Occurrence of the problem:**

The pest appeared as a serious problems of rice plant in low-lying boro field not from so many years ago. Farmers identified it as a serious pest from 1998-99 sessions. The pest had been creating lots of suffering in rice cultivation for five years last. At the present time it ranked as the main problem.

### **iii) Description of the problem:**

According to farmer's opinion, the morphological structure of the pest had similarity with the earthworm. Body colour was red with 1-2 cm length. It damaged the root of the rice plant. As soon as the new roots generated from the transplanted seedling, the infestation of the pest started. Only the root zone is infested by this pest. The rice plant turned into reddish coloured and ultimately the growth of the plant is stopped. The plant is unable to uptake nutrients although sufficient fertilizer applied to the field.

### **iv) Existing management practices:**

When the pest problem comes to farmer's attention, they wanted to make a solution by discussion among them and decide to go to the local pesticide dealers for suitable suggestion. They suggested applying granular insecticide such as Furadan, Basudin, Diazinon etc. But the effectiveness of these granular insecticides applied in the severe infested field was not satisfactory. Moreover they were unable to use high amount of pesticide to reduce the infestation, as these were cooperatively costly. Since the last two years, they used a liquid pesticide, which is locally known as "Indian gas" bearing the trade name "Kripcord". Farmers showed much interest to apply this pesticide, as it was low costly and very effective in comparison to the granular insecticides. After the application of this chemical, the pest came out from the surface soil within few hours where the granular insecticide took at least one to two days.

When this liquid pesticide applied in the infested field the pest come out from the surface layer of the soil within few moments and confined themselves with crumpled condition where hundreds of pests available in a single point. At this condition, the pest could alive more than one or two days. The pesticide used by the farmers bearing the trade name "Kripcord" is manufactured in India. Some chemical pesticide manufactured in Bangladesh bearing the trade name 'Ripcord' or 'Cymbush' contained the same active ingredients

### **v) Farmers general opinion:**

On the basis of five years observation experience, farmers of this region came to a decision that it is quite impossible to grow better crops without using any chemical insecticide to protect the infestation of this pest (Chera).

Few farmers noticed that the infestation of this pest could be reduced by removing the water from rice field to make the soil hard and dry condition where pests were unable to survive. But they also gained the experience that when the rice field is irrigated the infestation of this pest is started. More over, it was quite impossible to drain out the irrigated water from the maximum number of rice fields.

## **II. Information collection by infested field observation:**

To observe the most damaging and newly occurred pest status, a field visit was made by the survey team with the farmers. Earlier, a total of eight rice fields were selected by the Entomologist, AAS where the infestation of this pest is more serious and farmers not used pesticide to control the pest. The fields were selected in Sonabaju villages of Boraigram district.

#### **i) Pest diagnosis:**

Removing the upper surface of the soil of infested fields by hands, pests were collected for close observation. The pests were thread/worm like structure with 10-15 mm long. Body colour was red. The third segment of the body was comparatively large with dark coloured mouthparts. Body divided into 12 segments where the last segment bears two-minute cerci like structure. When the pest comes out from soil surface, it showed rapid zigzag movement in the field water.

#### **ii) Nature of damage:**

The pest confined themselves within one inches of the surface soil. The pest damaged only the root zone and newly generated roots were attacked. Initially the colour of newly generated roots were whitish, but it turned into brownish when roots were attacked by the pest and in case of severe infestation, it turned into dark. It might be happened for sucking the cell sap from the root zone. The growth of the rice plant was reduced and tiller initiation rate was very slow. Ultimately the rice plant turned into pale to reddish brown colour.

#### **iii) Sample collection:**

To know more information about the newly occurred problem, the pest and the infested rice plants were collected to send to Bangladesh Rice Research Institute (BRRI), Gazipur and Entomology Division of Bangabandhu Sheikh Mujibur Rahman Agricultural University (BSMRAU), Gazipur. To collect the pest and plant samples, plastic container and poly bag was used. Professor Dr. Mahbubur Rahman, Professor and Head, Department of Entomology, BSMRAU took responsibility to send the pest and plant samples to Entomology Division of BRRI and BSMRAU for proper diagnosis.

#### **iv) Experimental plot preparation:**

According to the farmers opinion, at present this pest is a burning problem, But with in a short time it was not possible to identify its pest status and nature of damage. So, professor Dr. Mahbubur Rahman, BSMRAU and Mr. Harun-Ar-Rashid, ED, AAS decided to select one infested rice field for keen observation during the entire Boro rice season. To observe the infestation rate of the pest, the rice cultivars of the plot was requested not to apply any pesticide to control the pest. Water protecting bunds were made by mud to protect the selected plot from pesticide contamination. Farmers of this location encouraged initiating the research as the pest created lots of sufferings in rice cultivation.

### **8.3. Concluding Session:**

In the concluding session, among the respondent farmers, Md. Abdul Manik, teacher of Sonabaju High School spoke on behalf of participated five villages and expressed his heartiest thanks to the respondents and Agricultural Advisory Society (AAS) for an effective discussion on the present pest problem of rice crop. He mentioned that this survey programme is crucially important to know the agricultural problems in their areas. The respondent also ensured their future cooperation for such kind of activities.

Dr. Mahbubur Rahman, Professor and Head, Department of Entomology, BSMRAU started his speech with giving thanks to AAS and gave greeting to the respondents. He mentioned that farmers have been facing numerous problems in crop cultivation. Such kind of survey activities will help the researchers to know the actual information's at field level.

Mr. Harun-Ar-Rashid, Executive Director, AAS expressed his happiness at everyone's cooperation during the entire survey period. He told that AAS had been working on plant health problems to know more information about the pest and disease problems and to ensure the effective management practices. He gave thanks to Professor Dr. Mahbubur Rahman, BSMRAU for visiting the infested field and his great cooperation during the survey programme. He also hoped future cooperation from all the participants.

## **Conclusion:**

Farmers of the survey area identified the 'Chera' (earthworm) as the most damaging pest in the irrigated low-lying rice fields. Farmers of Natore district claimed about the infestation of this unknown pest, which came to their attention as a serious pest for the last four to five years. Even they claimed that this pest cannot be controlled by available pesticides and they often used some unauthorized chemicals such as 'Indian oil' (chemical name is kripicord in India & Ripicord in Bangladesh). To know the actual situation, AAS conducted a benchmark survey in Gurudaspur and Boraigram upazila of Natore district. Initially the pest specialists of the survey team identified the pest as a species of earthworm. It is well known that earthworms are beneficial for plant. But the farmers of the survey area gave their opinion that it is quite impossible to grow rice during boro rice season without proper control of this pest. Thus, it is necessary to send the pest and infested plant samples in the relevant research institutes for proper diagnosis. So, further research is crucially important to know more about the newly occurred pest problem (Chera) in irrigated low-lying rice fields.

## **Recommendations:**

Farmer's participatory survey should be conducted using the focus group discussion (FGD) approach at community in different areas of the country in order to give an overall view of the problem on 'Chera' (earthworm) in the irrigated low-lying rice field.

Further research about the newly occurred pest problem (Chera) is crucially important to know more information about the 'Chera'. Details investigation on the Chera should be done by the pest specialists. The samples of the Chera and infested plants should be sending to the relevant research institutes for proper diagnosis.

Farmer's participatory trial plots should be conducted on the management of the pest (Chera) with recommended pesticides application to unearth the fact in the problem areas across the country.

**Table.1: List of Major pests of rice identified by the farmers**

SI No	Local Name	Rank	Common name	Remark
<b>Insects</b>				
1	Ghugri poka	-	Mole cricket	Infestation is found only in the seedling stage
2	Mazra poka	-	Rice stem borer	
3	Gandi poka	-	Rice bug	
4	Chera poka	1	-	It is identified as the most damaging pest of irrigated rice
5	Kakra	-	-	Makes hole near the bund which is responsible for removing the irrigation water
6	Foring	-	Grass hopper	-
7	Pata morano poka	-	Rice leaf roller	
8	Sish kata poka	-	Rice ear cutting caterpillar	
<b>Diseases</b>				
1	Gora pocha rog	-	Foot rot	
2	Pata jhalshano	-	Bacterial leaf blight	
3	Tawa para	-	Sheath blight	

### Annex. I: List of participants of the survey in Natore District

SI No	Farmer's Name	Village	Union	Upazila
1	Md. Julmat Miahn	Jhakra	Dharabarisa	Gurudaspur
2	Md. Jarip Mian	Jhakra	Dharabarisa	Gurudaspur
3	Md. Abdul Gafur	Jhakra	Dharabarisa	Gurudaspur
4	Md. Shahadat Hossain	Jhakra	Dharabarisa	Gurudaspur
5	Md. Rinto Mian	Sonabaju	Dharabarisa	Gurudaspur
6	Md. Jobair Ali	Sonabaju	Dharabarisa	Gurudaspur
7	Md. Rasel Mian	Sonabaju	Dharabarisa	Gurudaspur
8	Md. Minto Mian	Sonabaju	Dharabarisa	Gurudaspur
9	Md. Maksud Sarker	Sonabaju	Dharabarisa	Gurudaspur
10	Abdul Mazit	Sonabaju	Dharabarisa	Gurudaspur
11	Md. Khaza Mian	Sonabaju	Dharabarisa	Gurudaspur
12	Md. Jashim Uddin	Sonabaju	Dharabarisa	Gurudaspur
13	Md. Abu Taleb	Santuspur	Dharabarisa	Gurudaspur
14	Md. Abdul Rauf	Santuspur	Dharabarisa	Gurudaspur
15	Md. Abdus Sattar	Ekori	Boraigram	Boraigram
16	Md. Farid Uddin	Ekori	Boraigram	Boraigram
17	Md. Taz Uddin	Ekori	Boraigram	Boraigram
18	Md. Abdul Manik	Ekori	Boraigram	Boraigram
19	Md. Zher Ali	Ramkantopur	Boraigram	Boraigram
20	Md. Aftab Uddin	Ramkantopur	Boraigram	Boraigram

## Annex. II:

# Agricultural Advisory Society (AAS)

House # 8/7, Block-B, Lalmatia, Dhaka-1207

**Sub-Project:** Plant Health Services *initiative* (PHS<sub>i</sub>) in Bangladesh

### *Schedule of Benchmark Survey*

**Venue:** Common Room, Sonabaju High School, Gurudaspur, Natore

**Conducted by:** Agricultural Advisory Society (AAS)

House # 8/7, Block-B, Lalmatia, Dhaka-1207

**Date:** 2 March 2004

Time	Topic/Event	Facilitator
10:30-10:55	Registration and Introduction of Participants	Nurun-Nabi/ Salam
10:55-11:00	Introducing the survey team	Murshedur Rahman
11:00-11:10	Well Come Address and clarifying the objectives	Mr. Harun-Ar-Rashid, ED, AAS
11:10-11:20	Participatory discussion on insects and diseases of rice	Harun/ Mahbub/ Murshed/ Sabina
11:20-11:30	Identification of the present pest problems	Harun /Mahbub /Murshed/ Sabina
11:30-12:00	Discussion on the present pest problem	Harun/ Mahbub/ Murshed/ Sabina
12:00-12:40	Infested field observation section	Harun/ Mahbub/ Murshed/ Sabina/ Masud
12:40-12:50	Discussion on collected plant health sample	Harun/ Mahbub/ Murshed/ Sabina/ Masud
12:50-1:00	Tea break	-
1:00 - 1:30	Concluding section	Harun/ Mahbub/ Participants (Farmers)