




WELCOME

To
The Presentation
On


A best practice case for pest surveillance
in context of ISPM-6



Presented


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The Agriculture of Bangladesh

- Agriculture accounts for about 22% of GDP and about 8 % of total exports.
- Horticultural Production in BD is not sufficient enough but its national and exports demand has remarkably increased.
- Only 6.2 percent of total arable land is under horticultural crops (including 3.2 percent potatoes and spices)



NPPO of Bangladesh


The plant protection activities of the country at national level are under the Director of Plant Protection Wing of the Department of Agricultural Extension under the Ministry of Agriculture. He is serving as NPPO of Bangladesh



Organizational Setup/Structure of the NPPO
Plant Protection Wing, DAE

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graph TD
    Director[DIRECTOR] --> AddDir[ADDITIONAL DIRECTOR]
    AddDir --> DD_PQ[Deputy Director Plant Quarantine]
    AddDir --> DD_PAC[DD, Pesticide Administration & Quality Control]
    AddDir --> DD_SF[DD, Surveillance & Forecasting]
    AddDir --> DD_OA[DD, Operation (Aerial & Ground)]
  
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Four Sections of The Wing

- i) Plant quarantine Section .
- ii) Pesticide administration & quality control Section .
- iii) Surveillance & forecasting Section.
- iv) Operation Section .




Pest Surveillance

Pest surveillance means identification the number of harmful and beneficial insects and weeds through regular and intensive observation in existing crop eco-system. To conduct forecasting and early warning of the crop pests , past years records are considered as basic materials.



The element of perfect surveillance

1. Data collection (Identification of harmful and beneficial pests)
2. Preparation of reports on time.
3. Delivery of reports on regular basis.
4. Data analysis of infestation and infection caused by pests and insects.
5. Time demanding and effective measures should be taken.
6. Data storage for future use.
7. More training on surveillance.
8. Ensure the supply of surveillance commodities.




The office personnel of DAE involved in surveillance forecasting and early warning

| Tire | Unit | Office personnel involved in surveillance work | Remarks |
|-------------------------|-------|--|---------|
| Headquarter | 01 | Deputy Director (Surveillance)-01 Entomologist-01 Staff-03 | |
| Region | 10 | Additional Director-10 | |
| District | 64 | Deputy Director-64 Plant Protection Specialist-64 | |
| Upazilla (Sub-district) | 485 | Upazilla Agriculture Officer-485 Agricultural Extension Officer-485 Sub-Assistant Plant Protection Officer-485 | |
| Block | 12640 | Sub-Assistant Agriculture Officer-12640 | 5 SAOs |




Conducting Surveillance on Minimizing Pest Risk in Rice




Procedure of surveillance on rice pest :

1. Selection of the representative surveillance block in each agricultural block comprises the total of 5 in each Upazilla (Sub District).
2. Selection of five units from each surveillance block which measures 20 hectare of rice field.
3. Selection of surveillance plot through randomization from each unit measuring 0.2 ha. of land.
4. Collection of data in every week of month during rice cultivation.



Procedure of surveillance on rice pest :

5. Observation of 20 hills across the angular side of the rice field in respect of identifying of the total number of pest and beneficial insects along with identifying the number infected or infested tillers and leaves.
6. Conducting 10 sweeps for identifying harmful and beneficial insects.
7. Total no. of surveillance block :
No. of upazillas X No. of Surveillance block= 485 X 5 = 2425.
8. The primary data collected from Surveillance Unit add in upazilla, from upazilla to district and district to headquarter and finally compiled together to get the concrete result for forecasting and other necessary actions.



Work distribution and responsibilities

a) Sub-Assistant Agriculture Officers (SAAO):

- #observe the surveillance plot
- #collect the information
- #fill up the form-1.
- # send the form-1 to Agricultural Extension Officer
- #observed the field other than the surveillance plot
- #inform the of infection and infestation to AEO /UAO regularly in the weekly meeting.

b) Sub-Assistant Plant Protection Officer (SAPPO) will visit 5 surveillance blocks including other block in every week and assist SAAOs to collect data. Moreover he will help AEO to compile the Upazilla figure.



Work distribution and responsibilities

c) Agricultural Extension Officer:

- #monitoring the surveillance
- #ensure appropriate data collection process
- #demonstrate process of from fill up
- #compile the weekly report in surveillance form-2.

d) Upazilla Agriculture Officer:


- # observe the whole surveillance activities of AEO, SAPPO, and SAAOs
- #ensure the report compilation delivery to the office of Deputy Director (DD) on time.



Work distribution and responsibilities

e) Plant Protection Specialist:


- # observe the surveillance activities of respective districts
- # monitoring the overall activities of upazilla agriculture office
- # compile the reports of upazilla in form-3.
- # delivery the report to Headquarter
- # maintain the continuous communication with Radio, TV, Newspapers, and meteorological department.



Work distribution and responsibilities

f) Deputy Director :

- #observe the overall surveillance and other activities of plant protection of the district and assist to fruitful surveillance
- # maintain the flow of surveillance reports from district to regional office.



Work distribution and responsibilities

g) Additional Director:

- #observe entire surveillance and Plant Protection activities of the region
- #ensure co-operative among the officers of surveillance chain

h) Deputy Director (Surveillance):

- #play the role of conducting surveillance, forecasting and early warning
- #compile the reports of 64 districts in form-4
- #send it to the Director PPW for talking necessary steps.



Work distribution and responsibilities

i) Director, Plant Protection Wing (PPW):

- inform Director General (DG) of Department of Agricultural Extension (DAE) in regular basis about the overall scenario for taking necessary steps.

j) Director general (DG), DAE:

- will give instruction to the Director of Field Service Wing and Plant Protection Wing. If necessary he will give instructions directly to DDs.



20 hills of rice are being observed for surveillance of insects and diseases mentioned below-

Brown Plant Hopper:
The number of insects will count for every week up to milking stage for each hill.

Rice Stem Borer:
Dead heads are count up to 65 days after transplanting. The white panicles are count after flowering.

Leaf Fly of Rice:
Infested leaves will be counted 35 days after transplanting.



20 hills of rice are being observed for surveillance of insects and diseases mentioned below-

% Dead Heart/ % Dead Head


% of infestation = $\frac{\text{No. of infested leaves/20 hills} \times 100}{\text{No. of total leaves/20 hills}}$



20 hills of rice are being observed for surveillance of insects and diseases mentioned below-

Leaf Roller:
Infested leaf should be counted up to vegetative stage.
% of damage caused by Leaf Roller = $\frac{\text{No. of infested leaves /20 hills} \times 100}{\text{No. of total leaves/20 hills}}$

Fruiting Stage:
Counting of infested flag leaves
% of damage = $\frac{\text{No. of damaged flag leaves/20 hills} \times 100}{\text{No. of total flag leaves/20 hills}}$




20 hills of rice are being observed for surveillance of insects and diseases mentioned below-

Rice bug:
Counting no. of rice bug in 20 hills during flowering stage.
% of insects/hill = $\frac{\text{Total no. of rice bug/20 hills} \times 100}{20}$

Green Leaf Hopper:
The no of Green Leaf Hopper will be counted by doing 10 sweeps.


Rat:
% of damaged by rat = $\frac{\text{No. of infested tillers/20 hills} \times 100}{\text{No. of total tillers/20 hills}}$



Diseases of Rice Plant

The hills that are selected for insects identification also used for diseases observation and are recorded in form-1. Surveillance starts from 14 days after transplanting. The randomly selected hill in the middle of the plot is considered as the unit of the surveillance.

Stem and Panicle Diseases:
Bakanae or Root Rot: Counting has been done from tillering booting stage.
% of infection = $\frac{\text{No. of infected tillers/20 hills} \times 100}{\text{No. of total tillers/20 hills}}$



Diseases of Rice Plant

a) Stem Rot and Sheath Rot:

% of infection due to Stem Rot
= $\frac{\text{No. of infected tillers/20 hills} \times 100}{\text{No. of total tillers/20 hills}}$

% of infection due to Sheath Rot
= $\frac{\text{No. of infected tillers/20 hills} \times 100}{\text{No. of total tillers/20 hills}}$

Diseases of Rice Plant

b) Sheath Blast:
Counting of infected panicles are done up to crop harvesting.
Infection of Sheath Blast

$$= \frac{\text{No. of infected panicles/20 hills} \times 100}{\text{No. of total tillers/20 hills}}$$

c) Sheath blight diseases:
Counting of infected sheath (tillers) once in a week upto milking stage.
Infection of Sheath Blight

$$= \frac{\text{No. of infected tillers/20 hills} \times 100}{\text{No. of total tillers/20 hills}}$$

Diseases of Rice Plant

Diseases of Leaves:
Bacterial leaf blight:
Intensity of infections are measured every week. Counting of infected leaves has been done from booting stage to dough stage.

Red streak diseases:
Intensity of infections are measured every week. Counting of infected leaves has been done from tillering stage to dough stage.

Diseases of Rice Plant

Diseases of Leaves:
Leaf Blast:
Counted diseases from transplanting to panicle initiation stage.
% of Bacterial Leaf Blight
% of Bacterial Leaf Streak
% of Leaf Blast

$$= \frac{\sum xy \times 100}{\text{Total no. of tillers/20 hills} \times 3 \times 4}$$

 $\sum xy$ = Summation of xy in 20 hills
 x = Scale of infection in observation hills
 y = Infected leaves no. in the same hill
 3 = Last 3 leaves in each hill
 4 = Highest scale

Diseases of Rice Plant

Diseases of Leaves:
Diseases intensity is measured according to below given scale:
 Scale 0 = No symptom of infection
 Scale 1 = 10% of leaves are infected
 Scale 2 = 11% to 25% of leaves are infected
 Scale 3 = 26% to 50% of leaves are infected
 Scale 4 = 51% to 100% of leaves are infected
 # Counting of infected leaves having the same symptoms in the same hill (Only last 3 leaves).
 # Counting tiller numbers.

BLB

| Hills | Y | X | Nos tiller/Hill | XY |
|-------|---|---|-----------------|----|
| 1 | 5 | 3 | 8 | 15 |
| 2 | 4 | 2 | 7 | 8 |
| 3 | 6 | 3 | 9 | 18 |
| 4 | 3 | 1 | 7 | 3 |
| 5 | 7 | 4 | 9 | 28 |
| 6 | 3 | 1 | 5 | 3 |
| 7 | 8 | 3 | 8 | 24 |
| 8 | 6 | 2 | 5 | 12 |
| 9 | 3 | 1 | 4 | 3 |
| 10 | 7 | 2 | 5 | 14 |
| 11 | 5 | 2 | 7 | 10 |
| 12 | 8 | 3 | 6 | 24 |
| 13 | 4 | 2 | 5 | 8 |
| 14 | 9 | 3 | 8 | 27 |
| 15 | 4 | 2 | 5 | 8 |

BLB


| Hills | Y | X | Nos tiller/Hill | XY |
|---------|---|---|-----------------|-----|
| 16 | 9 | 3 | 9 | 27 |
| 17 | 5 | 2 | 5 | 10 |
| 18 | 6 | 3 | 5 | 18 |
| 19 | 7 | 4 | 8 | 28 |
| 20 | 5 | 2 | 6 | 10 |
| Total : | | | 131 | 298 |

$\sum XY = 298$
 $\% \text{ BLB incidence} = \frac{\sum XY}{\text{Total no. tillers} \times 3 \times 4} \times 100$

$$= \frac{298}{131 \times 3 \times 4} \times 100$$

$$= \frac{29800}{1572}$$

$$= 18.46\%$$



Diseases of Rice Plant

Viral Disease:
Tungro Viral Diseases:
Counting of infected hills of tungro, once in a week after transplanting up to booting stage.

% of tungro diseases infection
= $\frac{\text{No. of infected tillers/20 hills} \times 100}{\text{No. of total tillers/20 hills}}$