

# DIAGNOSTIC GUIDE FOR RICE INSECT PESTS AND NEMATODES

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pests and nematodes*

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# **Diagnostic Guide for rice insect pests and nematodes**

**Guru Pirasanna Pandi G., Basana Gowda G., Naveen Kumar B. Patil, Totan Adak, Berliner J., S.D. Mohapatra, P.C. Rath and Mayabini Jena (2016)**

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## **Rice insect pests and nematodes**

### **Yellow stem borer (YSB)**



**Adult yellow stem borer**



**Egg mass in leaf tip**



**Dead hearts**

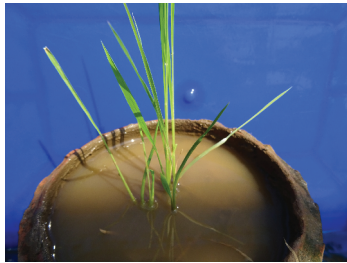


**White ear heads**

## **Asian rice gall midge (ARGM)**



**Adult gall midge**



**Silver shoot caused by gall midge**

**Brown planthopper (BPH)/White backed planthopper (WBPH)**



**BPH nymphs**



**BPH female adult**



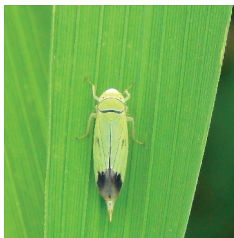
**WBPH**



**Hopper burn**



## **Green leaf hopper (GLH)**



**GLH adult**



**GLH infestation**



**Field infested with Rice Tungro Disease**

## **Leaf folder**



**Larvae**

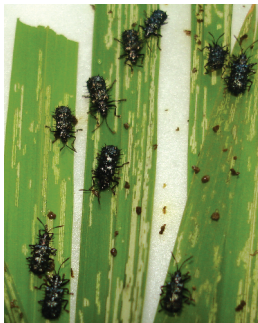


**Leaf folder adult**



**Folding in rice leaves**

## **Rice hispa (RH)**



**Adult of rice hispa**



**Severe field infestation of hispa**

## **Rice caseworm**



**Adult of case worm**

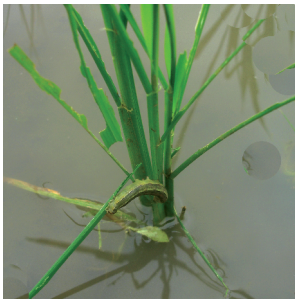


**Caeworm damage**

## **Swarming caterpillar**



**Larvae**



**Larvae feeding on stem**

**Rice bug/ Gundhi bug/ Ear head bug**



**Infected panicle**



**Gundhi bug**

## **Termites/white ants**



**Termites**



**Roots damaged by termites**

## **Rice mealy bug**



**Mealy bug**



**Sunken patches in field**



## **Rice panicle aphid**



**Aphid feeding on panicles**



**Damaged panicles**

**Rice root-knot nematode (RKN)/ Rice stem nematode/  
White tip nematode**



**Galls at root tip due to RKN**



**Rice stem nematode  
infested Seeds**



**White tip nematode  
infested leaves**

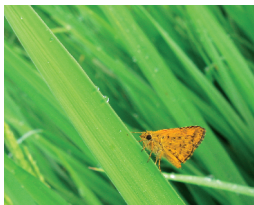
### **Minor pests of rice**



**Adult of green horned caterpillar**



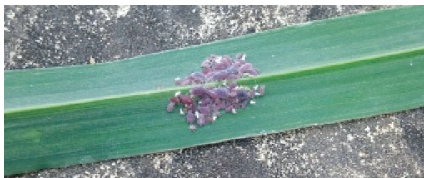
**White stem borer**



**Rice skipper**



**Grashopper**



**Aphids**



**Larvae of green horned caterpillar**



**Yellow hairy caterpillar**



**Rice root aphid**



**Thrips damaged leaves**

## **Beneficial orgnisms**



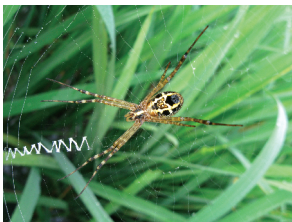
**Damselfly**



**Dragonfly**



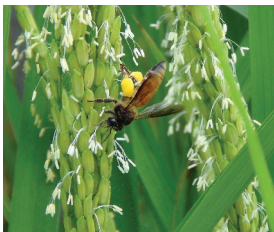
**Wolf Spider**



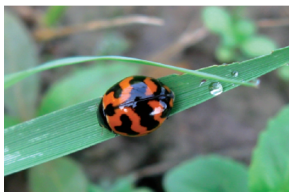
**Orb spider**



**Spider**



**Honey bee**



**Lady Bird beetle**

### **Economic Threshold level of rice insect pests**

<b>Pest</b>	<b>ETL</b>	<b>Management (Page)</b>
Gall midge	1 silver shoot/sq meter	20
Yellow stem borer	1 moth or egg mass/ sq meter or 1-2 dead heart/white earhead / sq meter	20
BPH/WBPH/GLH	5-10 hoppers/hill	21
Leaf folder/Caseworm	2 folded leaves / hill	21
Rice hispa	1-2 adult or 1-2 damaged leaf /hill	21
Swarming caterpillar	2 larvae/ sq m or 2 damaged tiller/hill	22
Gundhi bug	2 bugs/hill or 5 bugs/ sq meter	22
Thrips	1-2 rolling of leaves	22
Rootknot nemadote	1 gall/ tiller	22
Panicle mite	No ETL*	22

\*if mite appears in the previous season, prophylactic control measure need to be taken in the current season



## Management

### **Borers (Stem borer, Gall midge)**

- ❖ YSB monitoring through pheromone traps @ 2 traps/acre
- ❖ Set up light traps 1/ac wherever possible to attract and kill adults
- ❖ Seedling root dip in chlorpyrifos 20EC @ 1ml/liter water for 12 hours before transplanting
- ❖ Harvest the crop up to the ground level and disturb the stubbles
- ❖ Use *Trichogramma japonicum* twice @ 100, 000 adults, 3 days after brood emergence at 15 days interval
- ❖ Apply granular insecticides like chlorantraniliprole 0.4G 10 kg/ha, cartap 4G @ 25 kg/ha or carbofuran 3G @ 33 kg/ha or fipronil 0.3G @ 25 kg/ha
- ❖ Spray of chlorantraniliprole 18.5SC 150 ml/ha, Thiamethoxam 25WG 100 g/ha, cartap hydrochloride 50SP @ 1 kg/ha or flubendiamide 20 WG @ 125 g/ha coinciding with peak emergence of moths

**BPH/WPH/GLH**

- ❖ Alley planting (leaving one line) after each 10 lines
- ❖ Irrigation by alternate drying and wetting
- ❖ Avoid close planting and follow split application of N-fertilizer
- ❖ When insect crosses ETL spray Imidacloprid 17.8 SL @ 125 ml/ha or thiamethoxam 50 WG @ 100 g/ha or clothianidin 50 WDG 25 g/ha or ethofenprox 10 EC @ 500 ml/ha
- ❖ Conservation of natural enemies (spider, mirid bugs)

- ❖ Spraying should be direct towards basal portion of the plants. Repeat application if hopper population persists beyond 10 days after first application.

**Leaf folder/Case worm/  
Rice hispa**

- ❖ Spray neem oil 5ml/lit of water with 2ml detergent liquid
- ❖ Destroy alternate host weeds around rice fields
- ❖ Spray Imidacloprid 17.8 SL @ 125 ml/ha or Cartap hydrochloride 50 SP @ 1 kg/ha or Triazophos 40 EC @ 750 ml/ha

**Gundhi bug/Swarming caterpillar**

- ❖ Apply dust formulation of Malathion 5% @ 25 kg/ha
- ❖ Spray ethofenprox 10 EC @ 500 ml/ha or chlorpyriphos 20EC @2.5 lit./ha

**Termites**

- ❖ Seed treatment with chlorpyriphos 20EC @ 3-6ml/kg seed along with 10% solution of gum arabica just before sowing

**Mealybug/Thrips/Aphids/Panicle mite**

- ❖ Keep the field free from weeds

- ❖ Spray chlorpyriphos 20EC @ 2.5 lit./ha or profenophos 50 EC @ 1liter / litre on the infested fields.

**Root-knot Nematode**

- ❖ Summer ploughing and soil solarization of nursery beds with polythene sheet (50 micron)
- ❖ Apply neem cake @ 100 g/m<sup>2</sup> in the nursery
- ❖ Soil application of carbofuran @ 1 kg ai/ha at 7th and 50th days after planting or spraying with carbosulfan 0.4% twice at 15 day intervals

**Important information:**

- (i) If hand operated machine is used then use 200 litres of water for spraying the pesticides per acre of land.
- (ii) Use 80 litres of water for automatic machines per acre of land.
- (iii) Usually 500 litres of water required for one hectre of field.
- (iv) Protect your hand, face and eyes while spraying the medicine and wash your hands, face and eyes thoroughly with clean water after spraying.
- (v) Always keep the poison out of reach to the kids and children.

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