PEST OF RICE

More than 100 insect species are associated with the rice crop at one stage or the other and 20 of these are pests of major economic significance. Among the sucking pests, BPH, GLH, WBPH, rice earhead bug pose severe threat to rice production.

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Thrips: Stenchaetothrips bifurcata

Green leafhopper: Nephrotettix virescens, N. nigropictus and N. cincticeps

Brown plant hopper: Nilaparvata lugens

White backed plant hopper: Sogatella furcifera

Rice earhead bug: Leptocorisa acuta

Mealy bug: Brevennia rehi

Rice black bug: Scotinophora lurida and S. coarctata

Earhead stink bug: Menida histrio

Rice striped bug: Tetroda histeroides

White rice leafhopper: Cofana spectra

Blue rice leafhopper: Empoascanara maculifrons

Zigzag striped leafhopper: Recilia dorsalis
MAJOR PESTS

1. Thrips: *Stenchaetothrips biformis* (Thripidae: Thysanoptera)

**Distribution and status:** Bangladesh, India, Indonesia, Japan, Malaysia, Sri Lanka, Thailand and Vietnam. Minor but has potential to become major.

**Host range:** *Echinochloa* sp.

**Damage symptoms**

Both nymphs and adults lacerate the tender leaves and suck the plant sap, causing yellow or silvery streaks on the leaves of young seedlings. Terminal rolling and drying of leaves from tip to base is the typical symptom of attack. It causes damage both in nursery and main field.

*Leaf curling caused by Rice Thrips (IRRI)*

**ETL:** 60 Nos. per 12 wet hand sweeps in nursery

**Bionomics**

Adults dark brown, female inserts the eggs singly within the leaf tissues in young leaves. Egg period 3-5 days, life cycle completed in 13-19 days.
Management

• Spray endosulfan 35 EC 80 ml or monocrotophos 36 WSC 40 ml/800 m² nursery.
• Spray Endosulfan 35 EC 1.0 L or Monocrotophos 36 WSC 1.0 L or Azadirachtin 0.15% w/w 1.5-2.5 L or Lambda-Cyhalothrin 2.5 EC 500 ml or Lambda-Cyhalothrin 5 EC 250 ml in 500 L water/ha
• Grow resistant cultivars like PTB 12, PTB 20, PT 321, H 4

2. Green leafhopper: *Nephotettix virescens*, *N. nigropictus* and *N. cincticeps*  
*(Cicadellidae: Hemiptera)*

*Nephotettix virescens*                      *N. nigropictus*

**Distribution and status:** India, South Japan to oriental region, west of south Africa, Philippines, Formosa, Sri Lanka

**Host range:** Rice, millets, grasses

**Damage symptoms**

Both nymphs and adults desap the leaves and cause “hopper burn” due to heavy infestation. Yellowing of leaves from tip downwards is the typical symptom caused by this pest. However, it is more important as a vector for rice tungro virus, rice yellow dwarf and transitory yellowing diseases.

**ETL:** 60 Nos. / 25 sweeping – Nursery

10 Nos. / hill - Flowering stage

5 Nos. / hill - Vegetative stage

2 Nos. / hill - Tungro endemic area

**Bionomics**

Adults green with black spot and black patch on wings, gravid female inserts 200-300 eggs in batches of 8-16 in midrib of leaf blade. Egg period 6-7 days, nymphs undergo five instars and become adult in 25 days. Adult longevity 20-30 days. The population normally increases from August onwards, reaches maximum
during September - October and declines from November.

Management
1. Use resistant varieties like IR 20, IR 50, CR 1009, Co 46, PTB 2, PTB 18, IET 7301, IET 7302, IET 7303 and Vani, Vikra marka, Lalit, Nidhi
2. Nursery should not be raised near the lamp posts.
3. Apply neem cake @ 12.5 kg/800 m² nursery as basal dose.
4. Apply carbofuran 3 G @ 3.5 kg or phorate 10 G @ 1.0 kg or quinalphos 25 EC 80 ml or endosulfan 35 EC 80 ml per 800 m² nursery. Maintain the water level at 2.5 cm for 3 days after granular application.
5. Spray any of the following insecticide in 500 L water/ha
   - Acephate 75 SP 666-1000 g
   - Endosulfan 35 EC 1000 ml
   - Buprofezin 25 SC 800 ml
   - Ethofenprox 10EC 500-750 ml
   - Fipronil 5 SC 1-1.5 kg or 0.3 GR 16.7 - 25.0 kg
   - Fenobucarb (BPMC) 50 EC 500-1500 ml
   - Imidacloprid 17.8 SL 100 - 125 ml
   - Quinalphos 25 EC 1000 ml
   - Phosphamidon 40 SL 875 ml
   - Thiamethoxam 25 WG 100 g
   - Lambda-Cyhalothrin 2.5 EC 500 ml or 5 EC 250 ml
3. Brown plant hopper: *Nilaparvata lugens* (Delphacidae: Hemiptera)

**Distribution and status**

Orissa, Andhra Pradesh, Tamil Nadu, Karnataka, West Bengal, Maharashtra, Madhya Pradesh, Uttar Pradesh, Haryana and Punjab in India, South East Asia, China, Japan, Korea

**Host range:** Rice, sugarcane, grasses

**Damage symptoms**

Nymphs and adults congregate at the base of the plant above the water level and suck the sap from the tillers. The affected plant dries up and gives a scorched appearance called “hopper burn”. Circular patches of drying and lodging of matured plants are typical symptoms caused by this pest. It is the vector of grassy stunt, ragged stunt and wilted stunt diseases.

**ETL:** 8-10 Nos./hill or 20 Nos./hill when spider is present at 1 No./hill

**Bionomics**

The brown plant hopper has a brown body and chestnut brown eyes. Adult measures about 4 - 4.5 mm in length capable of flying a long distance drifting with the wind. Adults are of two forms viz., macropterous (long winged) and brachypterous (short winged). The female makes an incision in the leaf sheath and inserts 200-300 small eggs, egg period -6 days; nymphal period - 15 days and adult longevity 18-20 days.

**Management**

1. Use resistant varieties like Aruna, Karnataka, Karthika, Krishnaveni, Makon, Abhey, Asha, Divya, Py 3, Co 42, Co 46, PTB 21, Jyoti (PTB 29) and PTB 33, Manasarowar, Bhadra, IET 7575, IET 6315, MTU 1249, R 650 - 1820, Shyraksha, Arvindar, kartik, bharatidasan, neela, uday, sonasali, vajram, chaitanya, nagarjuna and chandana,

2. Avoid close planting and provide 30 cm rogue spacing at every 2.5 m to reduce the pest incidence.

3. Avoid use of excessive nitrogenous fertilizers.

4. Control irrigation by intermittent draining.

5. Set up light traps to monitor and control pest population.

7. Avoid use of insecticides causing resurgence such as synthetic pyrethroids, methyl parathion, fenthion and quinalphos.

8. Drain the water before the use of insecticides and direct the spray towards the base of the plants.

9. Spray neem seed kernel extract 5% (25 kg/ha) (or) neem oil 2% (10 L/ha).

10. Spray imidacloprid 17.8 SL 125 ml or buprofezin 25 SC 325 ml or or acephate 75 SP 625 g or or /ha.

   - Acephate 75 SP 665-1000 g
   - Methyl demeton 25 EC 1000 ml
   - Chlorpyrophos 25 EC 1250 ml
   - Benturacarb 3 GR 3.3 kg
   - Imidacloprid 70 WG 30-35 g
   - or 30.5 m/m SC 60-75 ml or 17.8 SL 100-125 ml
   - Buprofezin 25 SC 800 ml
   - Fenobucarb (BPMC) 50 EC 500-1500 ml
   - Dichlorvos 76 WSC 350 ml
   - Ethofenprox 10 EC 500-750 ml
   - Clothianidin 50 WDG 20-24 g
   - Fipronil 5 SC 1.0 -1.5 L or 0.3 GR 16.7 - 25.0 kg
   - Benfuracarb 3 GR 3.3 kg
   - Clothianidin 50 WDG 20-24 g

4. White backed plant hopper: *Sogatella furcifera* (Delphacidae: Hemiptera)

**Distribution and status:** India, Burma, Sri Lanka, China, Pakistan, Japan, Indonesia, Korea

**Host range:** Rice, maize, millets, sugarcane, grasses

**Damage symptoms**

Both nymphs and adults suck the sap and cause stunted growth and “hopper burn” leading to yield loss. “Hopper burn” is caused in irregular patches. Nymph falls on water keeping its legs stretched.

**Bionomics**

In white nymphs, vertex characteristically gives a narrow face to the hoppers. Forewings hyaline with dark veins and a dark spot in the middle of posterior edge. Pronotum pale yellow and adults possess a diamond like marking on the thorax. The
female lays upto 758 eggs in as many as 112 egg masses with 1-24 eggs in each in leaf sheath and in the mid rib of leaves. The ovipositional site characterized by black streaks. Egg period 6-7 days; nymphal period 12-17 days with five instars. The feamle longevity about 2 months.

**Management**

- Same as given for BPH.
- Use resistant varieties like AR 133, IC 25687, Tangner, Amelbero, HKR-10, HKR-126, IET 8116

5. **Rice earhead bug: Leptocorisa acuta (Alydidae: Hemiptera)**

**Distribution and status:** India and rice growing areas

**Host range:** Rice, Millets

**Damage symptoms**

Both nymphs and adults suck the sap from individual grains at milky stage. Affected grains become chaffy with black spots at the site of feeding puncture. Yield loss may be 10-40%. Obnoxious odour emanates on disturbing the bugs in the field.

**ETL:** 5 bugs/100 panicles or 1 bug/hill - flowering stage; 16 bugs/100 panicles or 3 bug/hill- milky stage.

**Bionomics**
Brownish green adults are slender with long legs and antennae, lay 200-300 flat, dark, reddish brown eggs in rows of 10-15 on the leaves or panicles. The egg period 5-8 days, green to brown nymphs undergo five instars in 17-27 days. Adults fairly long lived (30-50 days).

**Management**

1. Remove alternate host, *Echinocloa* from bunds and field.
2. Ensure synchronous planting on community basis in an area.
3. Use neem seed kernel extract 5% or notchi leaf powder extract 5% or *Ipomoea* leaf powder extract 5% or *Prosopis* leaf powder extract 5%
4. Dust quinalphos 1.5 D or carbaryl 10 D or malathion 5 D @ 25 kg/ha or spray malathion 50 EC 500 ml or monocrotophos 36 WSC 500 ml/ha.


**Distribution and Status**

Tamil Nadu, Andhra Pradesh, Karnataka, Orissa, Madhya Pradesh, West Bengal and Kerala in India, Bangladesh, Thailand

**Host range:** Rice, graminaceous weeds

**Damage symptoms**

Large number of insects remains in leaf sheath and suck the sap, affecting plants in circular patches. Plants become weak, yellowish and stunted. Presence of white waxy fluff in leaf sheath is a typical symptom of damage.

![Field damage caused by mealy bugs (IRRI)](image)

**Bionomics**

The mealy bug is small reddish white, soft-bodied, wingless insect covered with filamentous materials. It lays 126-139 eggs in the leaf sheath and reproduces parthenogenetically. The egg period 1-2 days; nymphal period 17-34 days, nymphs remain within the leaf sheath and suck the plant sap.
Management

1. Parasitoids such as *Adelencyrtus* sp., *Xanthoencyrtus* sp. and *Dolichoceros* sp. and coccinellid predators can be utilized.

2. Remove the grasses and trim the bunds during the main field preparation before transplanting.

3. Remove and destroy the affected plants.

4. Spray dimethoate 30 EC 500 ml/ha in initial stages of infestation.

7. Rice black bug: *Scotinophora lurida* and *S. coarctata* (Podopidae: Hemiptera)

**Distribution and Status:** India

**Host range:** Rice, millets

**Damage symptoms**

Both nymphs and adults suck plant sap from the culm during tillering to flowering at the base of the plant. It also sucks the sap from leaf sheath, leaf and panicle. The affected plants turn reddish brown or yellow. During tillering stage, it causes drying up of central shoot (dead heart), stunted growth and reduced tillers. During reproductive stage, it affects the panicle development and causes chaffy grains (white ears). In severe cases, plants wilt, dry and turn bug burned, similar to hopper burn damage of brown plant hopper.
**ETL:** 10% damage at tillering stage or 5 bugs / hill

**Bionomics**

Adults are brownish black with a prominent scutellum and pronotum having a spine on either side. 1 mm long greenish eggs are laid in masses on the stem and leaves that turn pinkish during hatching. Brown nymphs with yellowish green abdomen and 2-3 black scent glands.

![Bug Life Cycle Diagram]

**Management**

1. Keep the field free from weeds and grasses.
2. Drain the excess water from the field.
3. Set up light traps to attract and kill large number of bugs.
4. Conserve the predators *viz.*, spiders, coccinellids and wasps to check the pest.
5. Ducks can be allowed in the field to pick up the bugs
6. Spray NSKE 5% or monocrotophos 36 SL @ 1000 ml/ha or acephate 75 SP @ 625 g per ha for effective pest suppression.

**MINOR PESTS**

8. **Earhead stink bug / Shield bug / Red spotted bug: Menida histrio**  
   (*Pentatomidae: Hemiptera*)

   Both nymphs and adults suck the ear heads and cause individual grains chaffy.

![Earhead Stink Bug]


   The nymphs and adults suck the sap from the stem and cause stunting and
yellowing of tillers. Adult is brown with a prominent “V” shaped mark on its back. It lays cylindrical eggs in rows on the under surface of the leaves. The egg period 5-7 days, nymphal period 40-50 days, life cycle completed in 49-62 days. The adult longevity is about 2 weeks.

10. White rice leafhopper: *Cofana spectra* (Cicadellidae: Hemiptera)

   Nymphs and adults suck the sap causing yellowing of leaves and stunting of tillers. Nymphs are elongate and pale green coloured. Adults are white in colour, 3-4 times larger than green leafhopper. They are the biggest of rice hoppers.

11. Blue rice leafhopper: *Empoascanara maculifrons* (Cicadellidae: Hemiptera)

   Nymphs and adults suck the sap of the leaves and cause “hopper burn” in the seedlings in the form of whitish waxy lines on the leaf blades in the initial stage of attack and subsequent drying. Small blue leafhoppers with yellowish vertex having a black patch in the middle of pronotum.

12. Zigzag striped leafhopper: *Recilia dorsalis* (Cicadellidae: Hemiptera)

   Both nymphs and adults suck plant sap and cause tip drying and orange discoloration of both margins of leaves. Adults have white fore wings with pale brown bands forming the shape of W.
QUESTIONS

1. Terminal rolling and drying of leaves from tip to base in both rice nursery and mainfield.
   a. Thrips
   b. GLH
   c. WBPH
   d. BPH

2. __________ acts as a vector for rice tungro virus
   - Nephotettix nigropictus
   - Nilaparvata lugens
   - Cofana spectra
   - Empoascanara maculifrons

3. ETL for GLH in tungro endemic area
   a. 2 Nos/ hill
   b. 5 Nos / hill
   c. 10 Nos / hill
   d. 60 Nos / hill

4. Alternate host of Stenchaetothrips biformis is _______
   - Phaspalum scrobiculatum
   - Cyanodan dactylon
   - Panicum sp
   - Echinochloa sp.

5. Which of the following is white leaf hopper
   - Nephotettix nigropictus
   - Cofana spectra
   - Empoascanara maculifrons
   - Nilaparvata lugens

6. Which of the following is blue rice leaf hopper
   - Nephotettix nigropictus
   - Cofana spectra
   - Empoascanara maculifrons
   - Nilaparvata lugens

7. Hopper burn’ is the symptom of __________ pest in rice
   - Nephotettix nigropictus
   - Sogatella furcifera
   - Nilaparvata lugens
   - all the above
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| 8 | Use of synthetic pyrethroids may cause resurgence of sucking pest in rice Say  
   **True** or false |
| 9 | Tip drying and orange discoloration of rice leaves is typical symptom of  
   ------  
   a. *Nephotettix nigropictus*  
   c. *Recilia dorsalis*  
   b. *Empoascanara maculifrons*  
   d. *Nilaparvata lugens* |
| 10 | Which of the following pest causes damage to the grain at milky stage  
   ------  
   a. Earhead bug  
   b. Mealy bug  
   c. Black bug  
   d. Stink bug |
| 11 |  
   -------  
   a. *Nephotettix nigropictus*  
   b. *Empoascanara maculifrons*  
   c. *Nilaparvata lugens*  
   d. *Cofana spectra* |
| 12 |  
   -------  
   a. *Nephotettix nigropictus*  
   c. *Cofana spectra*  
   b. *Empoascanara maculifrons*  
   d. *Nilaparvata lugens* |
| 13 | Zigzag striped leafhopper belongs to  
   -------  
   a. Alydidae  
   c. Pentatomidae  
   c. Cicadellidae  
   d. Delphacidae |
| 14 | Rice black bug belongs to  
   -------  
   a. Alydidae  
   b. Pentatomidae  
   c. Podopidae  
   d. Delphacidae |
| 15 | ETL for rice earhead bug in milky stage - 16 **bugs/100 panicles or 3 bugs/hill.** |
| 16 | Green mirid bug which feeds on BPH  
   **Cyrtorhinus lividipennis** |
| 17 | Alternate wetting and drying is a good management technique for controlling  
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<thead>
<tr>
<th>a. BLH</th>
<th>c. GLH</th>
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<tr>
<td>b. WBPH</td>
<td>d. BPH</td>
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18. Rice earhead bug belongs to __________ family

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<thead>
<tr>
<th>a. Alydidae</th>
<th>b. Pentatomidae</th>
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<tr>
<td>c. Podopidae</td>
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