

Brown Plant Hopper



(Image source: NPPC)

Common name

Brown Plant Hopper

Scientific Name

Nilaparvata lugens

Primary host: Rice

Secondary host: Grassy weeds

Why is it a problem?

Adult and nymph brown planthoppers feed on the phloem sap of rice plants, which weakens the plants, causes stunted growth, and can even result in plant death under severe infestations. Heavy infestations often lead to a condition called "hopper burn," where the rice plants turn yellow, wilt, and eventually dry out and die. Additionally, brown planthoppers act as vectors for several viral diseases in rice, including the rice ragged stunt virus (RRSV) and rice grassy stunt virus (RGSV)

Where and when is it a problem?

It is an important pest of rainfed and irrigated rice, affecting all stages of paddy. Closed canopy of the rice plants, densely seeded crops, excessive use of nitrogen, and early-season insecticide spraying also favor insect development. In Bhutan, this pest is found causing damage at altitudes ranging from 259 to 2,044 meters above sea level.

Identification and life cycle

Egg: Eggs are cylindrical, slightly curved, 1 mm long, white at first, darker when about to hatch, with two spots - the eyes of the nymph. The eggs hatch in 4-8 days. They are laid in groups of 2 to 12.

Nymph: The newly hatched nymphs are cottony white, and turn purple-brown. They pass through five instars before becoming adults. The first instar is around 0.6mm long, growing to about 3.0mm in the fifth instar. They feed on plant sap

Adult: The adult hopper is 4.5-5.0 mm long and has a yellowish-brown to dark-brown body. The wings are subhyaline with a dull yellowish tint. It has two characteristic wing morphs: macropterous (long-winged) and brachypterous (short-winged).

Dispersal

Adult planthoppers have well-developed wings that enable them to fly. Nymphs can move short distances by walking or hopping. This allows them to spread within a rice field or to nearby plants, seeking food and suitable microhabitats

When can damage be expected?

Early signs of brown planthopper infestation include spotting small planthoppers on the sheaths of rice plants. These pests initially appear orange-yellow but turn brown as they mature. Infestation symptoms start with wilting and yellowing of rice plants, and as the population density increases, a condition known as "*hopper burn*" occurs, where leaves turn from orange-yellow to brown, dry up, and eventually lead to the death of the entire plant. Damage typically begins in small patches but can spread rapidly. Female planthoppers intensify the damage by laying eggs in the stems and midveins of rice plants. Additionally, these pests excrete honeydew, which promotes the growth of sooty molds, further compromising plant health



Hopper burns symptoms in the field (Image source: IRRI)

Hosts: In Bhutan, it has been reported on paddy.

Management

1. Detection

- Check for plants that are wilted, dried out, and collapsed due to hopper burn
- Look for BPH adults and nymphs on the stems

2. Cultural Control

- Remove weeds from the field and surrounding areas that can harbor hoppers
- Regularly check for planthoppers in the seedbed and field, focusing on stems and water surfaces.
- Drain fields for 3 or 4 days if heavy infestations occur. Studies indicate that draining disrupts the hopper habitat, reducing their reproduction, development, and feeding activity. Refill the fields after the hopper population has declined.

3. Biological Control

- Avoid indiscriminate insecticide use to protect natural enemies like spiders, mirid bugs, and egg parasitoids.
- Use light traps at night to monitor planthopper activity. Inspect fields daily if high numbers are found.

4. Chemical Control

- Pesticides should be used as a last resort, based on the Economic Threshold Level. The threshold is 20-30 planthoppers per hill at the tillering stage and 10-20 per hill at the reproductive stage. It is recommended that insecticide be applied to the base of the rice plants towards the evening, as this timing improves absorption and effectiveness.

The following insecticides are recommended for hopper control:

Insecticide	Insecticide group	Dilution rate	Dosage per acre
Chlorantraniliprole 18.5%	Anthranilic diamides	0.3 ml per liter of water	60 ml per acre (Water: 200 liters Chlorantraniliprole: 60 ml)
Chlorpyrifos 20% EC	Organophosphates	4 ml per liter of water	200-400 liters per acre (Water: 200 to 400 liters Chlorpyrifos: 800 to 1600 ml)
Cypermethrin 10% EC	Pyrethroids	1 ml per liter of water	200-400 liter per acre (Water: 200 to 400 liters Cypermethrin: 200 to 400 ml)

Note:

- Always wear personal protective equipment such as gloves, mouth cover, overalls, boots, goggles, etc.
- Always follow instructions on the product label, such as dosage, timing of application, and pre-harvest interval
- Rotate pesticides to prevent resistance development.

References

1. <http://www.icar-crida.res.in:8080/naip/bph.jsp>
2. <http://www.knowledgebank.irri.org/training/fact-sheets/pest-management/insects/item/planthopper>
3. <http://www.icar-crida.res.in:8080/naip/bph.jsp>
4. <https://animalia.bio/brown-planthopper>
5. <http://www.knowledgebank.irri.org/training/fact-sheets/pest-management/diseases/item/rice-ragged-stunt>
6. http://www.agritech.tnau.ac.in/expert_system/paddy/cppests_BPH.html
7. <http://www.knowledgebank.irri.org/training/fact-sheets/pest-management/insects/item/planthopper>