



Important Pests of Rice in Bhutan and their Control



**National Plant Protection Centre
Department of Agriculture
Ministry of Agriculture and Forests**

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**Important Pests of Rice in Bhutan
and their Control**
-A field guide for Extension Agents

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Rice armyworm

Mythimna separata

It is a sporadic pest and occasionally causes losses when an outbreak occurs. The young caterpillars feed on the leaves leaving only the midrib.

Eggs are white in color and laid in groups in-between the leaf sheaths or on the leaf blade. The adult moth uses a sticky secretion to hold the group in place.

Adult moths are pale and brick-red to pale brown with a very hairy body covered with dark specks and patches. Moths are nocturnal



Armyworm larva

Damage symptoms

- Feed upon leaf tips or along leaf margins.
- Feed upon whole leaves leaving only midribs.
- Cutting off leaf tips, leaf margins, leaves and even the plants at the base.
- Removal of whole leaves and plants.



Adult armyworm moth

Control measures

1. Flooding seedbed is the best defence against armyworms when the population is in the larvae stage. Flooding drowns the swarming larvae.
2. During outbreaks, spray Cypermethrin @1 ml/ 1 L water. The best time to spray is late in the day.

Rice caseworm

Nymphula depunctalis

Adults are small (about 1.5 cm in length) and delicate. They are snowy white, and the white wings are marked with a few light brown to black specks.

Individual egg is circular, flattened, and measures 0.5 mm in diameter.

First instar larva is pale cream with light yellow head. It is 1.2 mm long.

The pupa is cream in color and about 5.5 mm long.



Adult moth

Damage symptoms

- The larva scrapes the green tissue of the leaf with only the white epidermis remaining. The white epidermis appears ladder-like because of the young pale green larvae feeding on the surface of tender leaves.

- Older larvae are enclosed within the case and feed by scraping leaf tissues or biting through leaf sheaths.
- The cases float in water to spread the attack to other plants of the same and other fields.

Control measures

- Draining the field for at least three days will kill larvae as they are highly dependent on water for oxygen
- During outbreaks, spray Cypermethrin @ 1 ml/1 L water or Chlorpyrifos@4 ml/ 1 L water.



Rice caseworm larva



Tillers infested by rice case worm

Rice leaf folder

Cnaphalocrocis medinalis

Adult moths are medium-sized (8-10 mm long and 16-20 mm wing expanse).

They are light brown with shiny, brownish yellow wings adorned with dark, broad margins and 2-3 dark vertical stripes.

Eggs are oval, creamy white. Newly emerged larvae are dull white or light yellow with a brown head, but soon turn green once feeding starts.

Fully grown larvae are slender and 20-25 mm long.

Damage symptoms

- Larvae feeds inside the folded leaf creating longitudinal white and transparent streaks on the blade
- Larvae fold a leaf blade together and glue it with silk strands.
- Young larvae feeding on the base of the youngest unopened leaves
- Heavily infested fields appear scorched with many folded leaves



Adult moth

Control measures

- Removing grassy weeds from rice fields and surrounding areas may prevent the build-up of rice leaf rollers on alternate hosts.
- If infestations of the flag leaves are extremely high (>50%) during maximum tillering and maturity stage, insecticide sprays may be useful. Spray Chlorpyrifos @ 4 ml/ L water.



Leaf infested by rice leaf folder



Rice leaf folder larva

Rice Bug

Leptocorisa sp.

The eggs are oval, shiny and reddish brown in color and are laid in batches of 10-20 in one to three rows along the midrib in the upper surface of the leaf

The early nymphs are greenish but they become brownish as they grow.

The adult bugs are 15-20 mm long, slender with long legs and antenna.

Damage symptoms

- Nymphs and adults spoil the seeds by sucking out their contents when they are still soft, i.e., from flowering to the dough stage.
- Microorganisms enter the damaged seed and cause them to dry out and discolor. Infestations of the rice bug are highest at the beginning of the rainy season.
- As a result of the feedings panicles bear partially or entirely empty grains.
- The bugs can also give an unpleasant smell to the rice

Control measures

- In small plantings, use a sweep net to capture the bugs. This is best done in the early mornings or late afternoons when the bugs are more active.
- During outbreaks, use Cypermethrin @ 1 ml per liter of water or chlorpyrifos@4 ml per liter of water.



Adult bug feeding on rice grain



Adult rice bug

Green Horned Caterpillar

Melanitis leda

Green horned caterpillars are minor pests of rice

The butterfly is dark brown with large wings having a few black and yellow eye-like markings one on each of the forewings and six ocellar spots on hind wings

Egg is white, round laid singly on the paddy leaves

Larva is green with roughened skin flattened dorsally and has a dark brown head with a pair of red horn like processes and two yellow processes in the anal end.

It feeds on the leaves

Damage symptoms

- Larvae of green horned caterpillars feed on leaf margins and leaf blades.
- The feeding damage causes removal of leaf tissues and veins.

Control measures

- Natural biological control agents often keep the larval population under control.
- During outbreaks, spray Chlorpyrifos@ 4 ml per liter of water



Adult moth



Adult larva feeding on leaf

Rice stem borer

Four species of stem borers attack paddy in Bhutan.

They are spotted stem borer (*Chilo partellus*), yellow stem borer (*Scirpophaga incertulas*), White stem borer (*Scirpophaga innotata*) and Asiatic pink stem borer (*Sesamia inferens*)

Damage symptoms

- Causes dead heart or drying of the central tiller during the vegetative stage that can be easily pulled from the base.
- Causes Whiteheads during reproductive stage where the emerging panicles are whitish and unfilled or empty.
- Larvae suspend themselves from leaves by silken threads and blown to other plants to feed.
- Mature larvae bore into the sheath and tiller of the plant.

Control measures

- The crops should be harvested at ground level to remove the larvae in stubble.
- Stubble ploughing kills the caterpillars in the stalks and crop residues.
- The level of irrigation water can be raised periodically to submerge the eggs deposited on the lower parts of the plant.
- Rogue out whiteheads when seen in the field
- During outbreaks, a systemic pesticide (dimethoate at 2ml per litre of water) is necessary



Dead heart of central tiller



White heads



Yellow stem borer moth



White stem borer moth



Pink stem borer moth



Stem borer larvae

Green rice leaf hopper

Nephotettix virescens

Adults are wedge shaped insects pale green in color.

A pair of black spots is either present or absent on the forewings.

As the insect matures, blackish markings on the abdomen and blackish band on the last abdominal segment become more prominent.

Damage symptoms

- Both nymphs and adults suck the plant sap from the leaf and leaf sheath that can result in browning of leaves (hopper burn)
- Yellowing of leaves from tip to downwards
- Plant stunted with reduced vigor
- Green leaf hoppers are vectors of virus diseases like tungro, leaf yellowing, yellow dwarf and yellow orange leaf.

Control measures

- Set up yellow sticky traps to attract and kill hoppers
- Light traps are used to attract and control the leaf hoppers vectors as well as to monitor the population
- When hoppers population crosses ETL (5-10 insects/hill at vegetative stage; 10 insects/hill at reproductive stage, spray dimethoate @ 2 ml per litre of water.



Adult green leaf hopper



Nymph of green leaf hopper

Brown plant hopper

Nilaparvata lugens

Adult hopper has a yellowish brown to dark brown body. The wings are sub hyaline with a dull yellowish tint.

Eggs are white, transparent, slender cylindrical and curved.

Freshly hatched nymph is cottony white and it turns purple-brown.

Damage symptoms

- Nymphs and adults congregate at the base of the plant above the water level.
- Affected plant dries up and gives a scorched appearance called "hopper burn".
- It is vector of grassy stunt, ragged stunt and wilted stunt diseases.
- At early infestation, circular yellow patches appear which soon turn brownish due to the drying up of the plants.
- The patches of infestation then may spread out and cover the entire field.

Control measures

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Hopper burn caused by brown plant hoppers



Adult brown plant hopper



Presence of Brown plant hopper nymphs and adults at plant base

References and photo courtesy

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