

Extension Fact Sheet 64: *Nilaparvata lugens*



Common name: Brown planthopper

Scientific name: *Nilaparvata lugens*

Hosts: Rice and wild grasses.

Damage

Both adults (photo, below right) and nymphs (photo, left) do the damage. They have piercing mouthparts that they insert into the leaf blades and leaf sheaths ('stems') of rice plants to suck the sap. Also, egg laying blocks the water and food channels inside the plant.

Symptoms depend on variety, number of planthoppers, and plant age: tiller and panicle number, and plant height, are reduced; grains are unfilled; injury from feeding and egg laying allows entry of fungi and bacteria, and sooty mould fungi blacken stems. Severe infestations cause plants in the 'milk' or 'dough' stages to gradually yellow from the tip, brown, dry out and collapse (a wilt, known as 'hopperburn'; photo, above right). The most susceptible time is from tillering to flowering. Hopperburn is more common in paddy than dryland rice.

Biology and Life Cycle

Eggs are laid in the midrib of the leaf blades, 4-10 in an egg mass; they 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. Nymphs are creamy white with a pale brown tinge, later becoming dark brown. There are four to five moults. The final nymphs are nearly 3 mm long, with a line from the top of the head to the middle part of the body where it is widest. Adults are brownish black with a yellowish-brown body. There are two forms, long winged (photo, above) and short winged.

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Infestations start with the arrival of the winged form, which then produce wingless types. Winged form develops when numbers are high; females are about 4 mm and males 4.5 mm; wingless forms are smaller. After harvest, the planthoppers migrate to grasses, or spread to new crops of rice. Brown planthoppers live for up to 20 days.

Detection and Inspection

Look at the base of the plants, where it is shady and humidity is high, for the nymphs and winged and wingless adults. Look for the sooty mould fungi that often accompany large numbers of the insects. More than 3-5 insects per tiller is considered high, needing more intensive observation and possibly insecticide treatment.

Management

Over use of insecticides is the main cause of outbreaks of Brown planthopper. IPM programs stress the need to main biological control – natural enemies – and also include resistant varieties. The routine use of insecticides should be avoided.

Natural enemies:

There are a number of natural predators of the Brown planthopper: spiders eat the nymphs and adults, as do coccinellid beetles, dragonflies and damselflies. There are two species of mired egg-sucking bugs - *Cyrtorhinus chinensis* and *C lividipennis* – in Solomon Islands, and there are likely to be wasp parasitoids that attack eggs, as well as fungal pathogens and mites.

Cultural control:

- Drain the paddies for 3-4 days during the early stage of infestation;
- Split applications (three times) of nitrogen fertilizer;
- Avoid staggered planting, preventing planthoppers moving from older to younger crops;
- Remove volunteer plants;
- Rotate rice with other crops.

Resistant varieties:

Egg laying and survival of nymphs differs between rice varieties. Many varieties have been bred for resistance to Brown planthopper; unfortunately, there are many cases when changes in the insect have overcome the resistance.

Chemical control:

Insecticides should only be used when planthopper populations are likely to reach an economic injury level; otherwise natural enemies will be destroyed and planthopper populations will return greater than before. The systemic insecticide, Orthene (acephate), has been used for many years against the Brown planthopper in Solomon Islands. Check for current recommendations from MAL Research/Extension officers, as well as the timing and method of application. **READ THE INSTRUCTIONS BEFORE USING ANY PESTICIDE.**