Adult: Adults are 3-5 mm long, bright green with variable black markings, wedge shaped with a characteristic diagonal movement. Male insect has a black spot in middle of the forewings that is absent in females. The insect is active during July to September.

3. **Brown planthopper/ Fulgorid,** *Nilaparvata lugens,* Delphacidae, Hemiptera

Symptom of attack: Symptoms will not be visible from outside in the early stages, but if we enter the field and tap the plants large number of this insect can be seen. They are visible only when the damage has been severe, the plants present a burnt up appearance, **hopper burn,** in circular patches.

Nature of damage: Both the nymphs and adults remain at the ground level and suck the plant sap. It is a typical vascular feeder primarily sucking phloem sap leading to **hopper burn**. 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. The grain setting is also affected to a great extent. During sustained feeding, it excretes a large amount of **honeydew**. It also acts as **vector of the virus diseases** like grassy stunt, wilted stunt and ragged stunt. (Transmission of persistent ragged stunt and grassy stunt virus require more time. Sheath blight and stem rot incidence was high in BPH infested plants.)

Life stages

Egg: Eggs are laid in a group of 2 to 12 in leaf sheath (near the plant base or in the ventral midribs of leaf blades). White, transparent, slender cylindrical and curved eggs are thrust in straight-line in two rows. (They are covered with a dome-shaped egg plug secreted by the female. Only the tips protrude from the plant surface.)

Nymph: Freshly hatched nymph is cottony white, 0.6 mm long and it turns purple-brown, 3.0 mm long in the fifth instar.

Adult: Adult hopper is 4.5-5.0 mm long and has a yellowish brown to dark brown body. The wings are sub hyaline with a dull yellowish tint. It has two characteristic wing morphs: **macropterous** (long winged) and **brachypterous** (short winged). (Wing morphism is influenced by various factors *viz.,* crowding during the nymphal stage and reduction in the quality and quantity of food, short day length and low temperature, which favour macroptery)

4. **Whitebacked planthopper,** *Sogatella furcifera,* Delphacidae, Hemiptera

Symptom of attack: Heavy infestation cause outer leaves of a hill to show burn symptoms. Damage in the form of **hopperburn** appears uniformly in a rice field, whereas it appears as circular patches in the case of BPH.

Nature of damage: WBPH is more abundant during the early stage of the growth of rice crop, especially in nurseries. (It attacks less than four-month old plants in fields with standing water and shows a marked increase with the age of the crop. Rice is more sensitive to attack at the tillering phase than at the boot and heading stages.) Damage is caused through feeding and oviposition. Gravid females cause **ovipositional punctures** in leaf sheaths. Both nymphs and adults suck phloem sap causing reduced vigour, stunting, yellowing of leaves and delayed tillering and grain formation. (Rice crop fails to produce complete grains [seedless glumes] and this condition is known as *red disease* in Malaysia.) Feeding puncture and lacerations caused by ovipositor **predispose the plants to pathogenic** organisms and