Nature of damage: Only larvae damage grains, adults being harmless. Grains are hollowed out. It attacks both in fields and stores. In stored bulk grain, infestation remains confined to upper 30 cms depth only. Caterpillar enters the grain through crack or abrasion on grain. It feeds inside and remains in a single grain only.

Egg: White eggs on the surface of damp grains in stores or fields, which soon become red.

<u>Larva</u>: White with yellow head. <u>Pupa</u>: Pupates in cocoon inside the grain.

Adult: Dirty yellowish brown with narrow pointed wings completely folded over back in a sloping manner.

10. Potato tuber moth, Pthorimaea operculella, Gelechiidae, Lepidoptera

Host range: Potato.

Symptom of damage: Mine leaves and drooping of twigs of the plants in the field. Black excreta peeping out near the eye buds as a result of tunneling by caterpillars. Rotting and foul-smelling tubers due to bacterial infection caused by caterpillar injuries are the common in the godowns.

Nature of damage: In the field, the larvae mine into leaves or bore into tender shoots and developing tubers. It is carried over to the storage rooms.

Egg: Eggs are laid singly on the undersurface of leaves or on exposed tubers.

Larva: Yellowish caterpillar with a brown head.

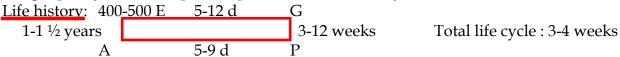
<u>Pupa</u>: When full grown pupates in a silken cocoon among trash, clods of earth, etc. on the ground or o seams of bags and in crevices in the floor or on walls.

Adult: Small dark brown moth.

## **SECONDARY PESTS**

11. Rust red flour beetle, *Tribolium castaneum*, Tenebrionidae, Coleoptera Confused flour beetle, *Tribolium confusum*, Tenebrionidae, Coleoptera

Host range: Broken grains/ mechanically damaged grains, germ portion and milled products. Heavy infestation causes stinking odour in flour, adversely affecting the dough quality. It is an important pest for mill machinery.



Symptom of damage: Presence of grub, adults, moulted skin in the flour, acid odour. Nature of damage: Grubs feed on milled products. Flour beetles are secondary pests of all grains and primary pests of flour and other milled products. In grains, embryo or germ portion is preferred. They construct tunnels as they move through flour and other granular food products. In addition they release gaseous quinines to the medium, which may produce a readily identifiable acid odour in heavy infestations.

Egg: White, translucent, sticky, slender and cylindrical.