

Total life cycle : 25 d

Symptom of damage: Presence of round tunnel (1 mm) in grains and root crops. In bagged storage irregular messy waste flour spots indicate infestation of the pest. Presence of frass, shelled grains and foul smell.

Nature of damage: Heating is very common. Infestation is confined to a small area. Grubs and adults cause damage and are voracious feeders. Adults reduce the grain kernels to mere frass. Grubs eat their way into the grain or feed on the grain dust or starchy material and are capable of attacking grain externally.

Egg: Eggs are laid on the surface or on the interstices of cereal grains singly or in clusters.

Grub: White, apodous with brown head, free living upto 3<sup>rd</sup> instar.

Pupa: Grub enters the grain after 3<sup>rd</sup> instar for pupation.

Adult: Brown to blackish beetle, head is deflexed downwards below prothorax to such an extent that it is almost hidden in a dorsal view. There is a prominent constriction between prothorax and elytra. Antenna clubbed with large loose three-segment.

4. Cigarette beetle, *Lasioderma sericorne*, Anobiidae, Coleoptera

Host range: Wheat flour, cereal bran, peanuts, cocoa beans, cottonseed, spices and even insecticides containing pyrethrum, meat and fishmeal, ginger, turmeric and chillies.

Symptom of damage: Circular, pinhead sized bore holes on processed tobacco.

Nature of damage: Grub causes the damage.

Grub: White, fleshy and hairy grub.

Adult: Small, robust, oval, light brown round beetle with its thorax and head bent downward; gives the insect a humped appearance. Elytra have minute hairs on them and are not striated. Total life cycle is 30-50 days. Six generations in a year.

5. Drug store beetle, *Stegobium paniceum*, Anobiidae, Coleoptera

Host range: Turmeric, coriander, ginger, dry vegetable and animal matter.

Symptom of damage: Circular pin-head sized bore hole.

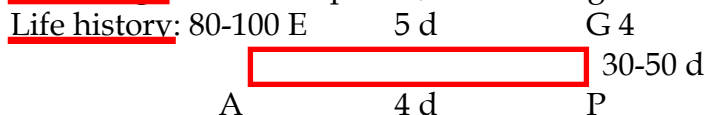
Nature of damage: Grub causes the damage.

Grub: Similar to cigarette beetle but not hairy.

Adult: Reddish brown round beetle with striated elytra and clubbed antenna.

6. Pulse beetle, *Callosobruchus chinensis*, *C. maculatus*, Bruchidae, Coleoptera

Host range: All whole pulses, beans and grams.



Symptom of damage: Grains with white cigar like eggs on seed coat and circular exit hole.

Nature of damage: Grubs eat up the grain kernel and make a cavity. Adults come out making exit holes.