IMPORTANT INSECT PESTS OF STORED FOOD

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Categories of Insect Pests of Stored Food

- Primary Pests – Cause initial injury
  - capable of successfully attacking, feeding and multiplying on previously undamaged grains;
  - are adapted to feed on a narrow range of commodities;
  - usually cause very distinctive damage;
  - usually develop within the grains, and often complete their entire development within a single grain;
  - are selective in their egg-laying behaviour;
  - often infest the ripening crop before harvest; and
  - usually cannot develop on the same food if the grains are ground (milled).
- Secondary Pests – Take advantage of injury.
  - not capable of attacking previously undamaged grains, but can only attack and breed in grains that have been damaged by primary pests, physical damage by bad handling, threshing that removes or damages the seed coat.
  - usually attack a very wide range of commodities;
  - usually cause non-distinctive damage;
  - sometimes develop within grains, but never complete their development within a single grain;
  - do not usually have selective egg-laying behaviour;
  - are very rarely found on the crop at harvest; and
  - are usually capable of developing on the same food after it is ground.

Lesser Grain Borer

Feeding strategy: Primary Pest

Commodities attacked: whole cereal grains

Identification:

i. Dark brown to black beetle
ii. 2-3mm long
iii. Head is bent down and thorax with punctures

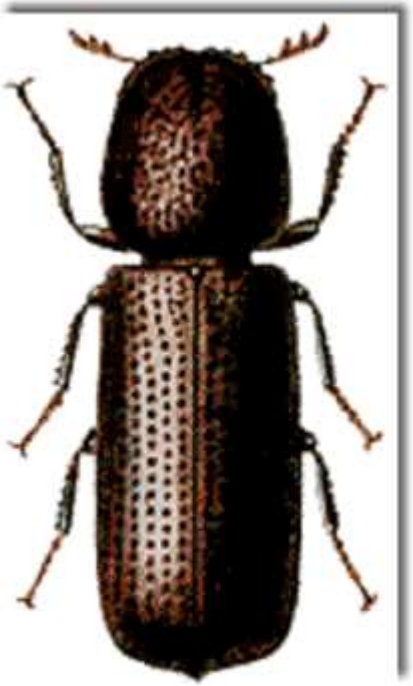
Optimum Conditions:

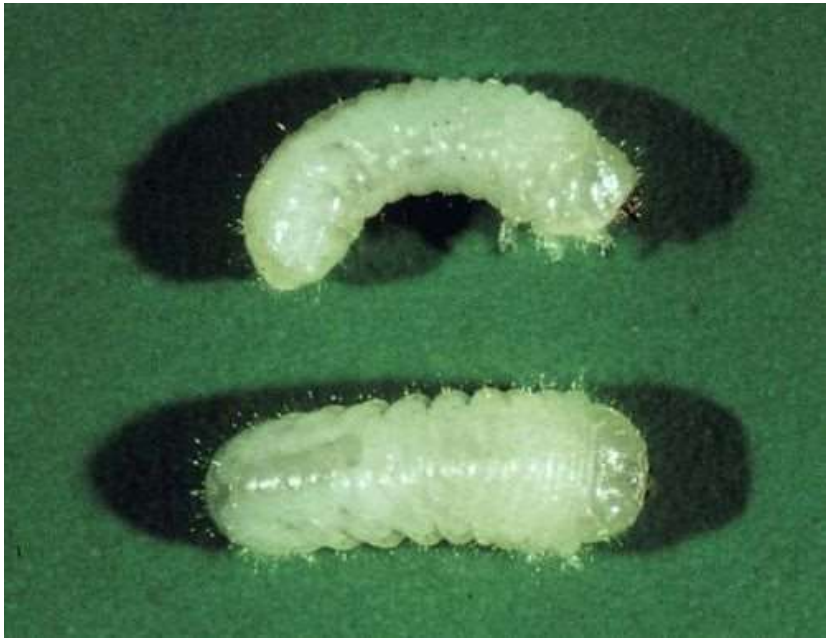
Temperature 34 °C and RH 70% Duration: 25 days

Damage: by both adult and larvae

i. Adults make burrows, tunnels and irregular holes and produce large amount of flour and produce sweet smell.
ii. Don’t produce heat and moisture
iii. May produce allergy if feeding on infested grains

Lesser Grain Borer





Rice Weevil

Feeding strategy: Primary Pest

Commodities attacked: whole cereal grains, some pulses

Identification:

i. Brown to black beetle, 2.5-4mm long
ii. Two dull orange yellow spot on elytra
iii. Prothorax and snout marked with circular punctures

Optimum Conditions:

Temperature 30 °C and RH 70% Duration: 25 days

Damage: by both adult and larvae

i. Larvae produce large cavities inside the grain and adult on emergence produce large holes.
ii. Produce heat and moisture
iii. Encourage the development of mould and other secondary pests

Rice Weevil

Red Flour Beetle

Feeding strategy: Secondary Pest

Commodities attacked: Dried material of plant and animal origin, cereals and products (pest of milling cereals)

Identification:

i. Redish brown beetle, 2.6-4.4mm long
ii. Head straight, punctures in the centre of prothorax
iii. Antennae form a distinctive club (head like)

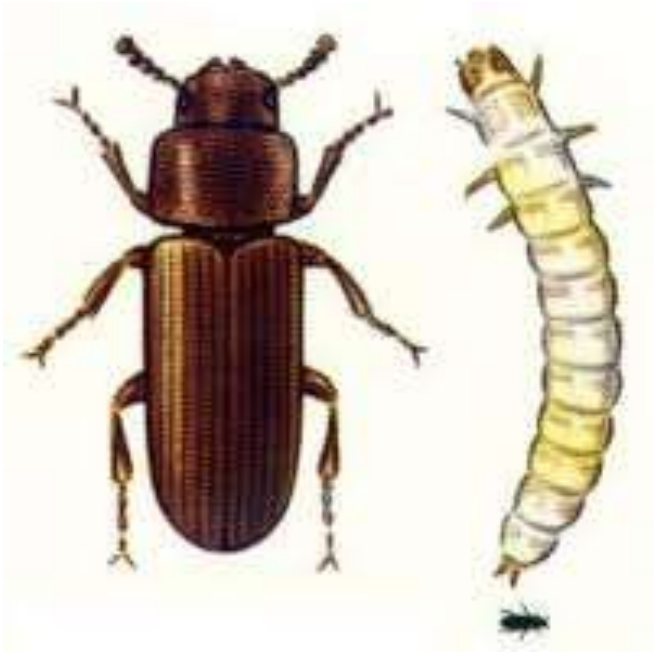
Optimum Conditions:

Temperature 35-37.5 °C and RH ≥70% Duration: 20 days

Damage: by both adult and larvae

i. Infestation cause persistent disagreeable odours in the commodity due to secretions of benzoquinones from the abdominal glands.
ii. Produce heat and moisture during damage
iii. Encourage the development of mould.

Red Flour Beetle



Khapra Beetle or Dermestid Beetle

Feeding strategy: Primary and Secondary Pest

Commodities attacked: Dried material of plant and animal origin, cereals and cereal products.

Identification:

i. Oval, light to dark brown beetles covered with hairs
ii. 1.8-3mm, Elytra with irregular pale markings
iii. Larvae is with hairy body

Optimum Conditions:

Temperature 33-37 °C and RH 45-75% Duration: 25 days

Damage: by larvae

i. Produce large amount of cast larval skins in or around the infested material.
ii. Initially feeds on damaged grains but later attack on whole grains
iii. Under unfavourable conditions, larvae enter in a state of suspended animation (diapause) and survive for upto eight years in this form

Khapra Beetle or Dermestid Beetle

Dhora Beetle or Seed Beetle

Feeding strategy: Primary Pest

Commodities attacked: Pulses

Identification:

i. Beetle with long legs and antennae; 3-7 mm long
ii. Elytra with light and dark patches, not fully covering abdomen.
iii. Underside of the abdomen covered with fine hairs.

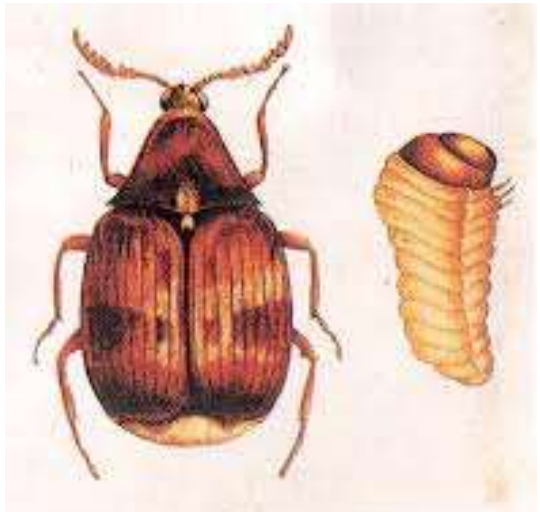
Optimum Conditions:

Temperature 32°C and RH 90% Duration: 22 days

Damage: by larvae

i. Larvae concealed inside the grain and adult on emergence leave a neat circular holes in seed.
ii. It consumes about 25% of seed from which it emerges.
iii. Damage cause heating of commodity which result in quality loss and mould growth.

Dhora Beetle or Seed Beetle



Saw-Toothed Grain Beetle

Feeding strategy: Secondary Pest and mould feeder

Commodities attacked: Grain and grain products, oilseeds, nuts, herbs and spices, dried fruit

Identification:

i. Small beetle, highly flattened body, 2.5-3.5 mm
ii. Orange to dark brown
iii. Tooth like projections along the side of prothorax

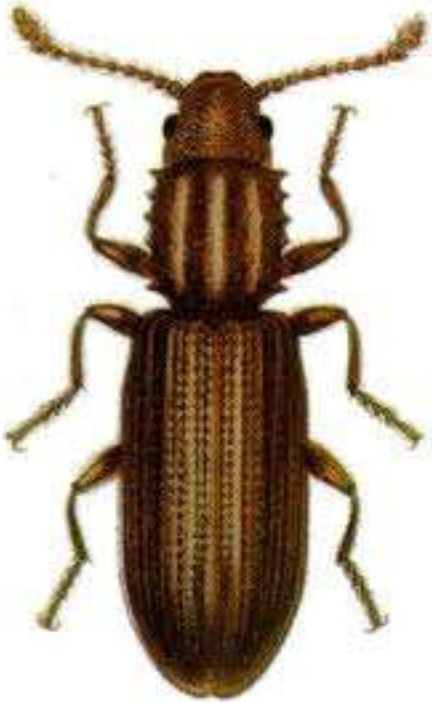
Optimum Conditions:

Temperature 30-32.5°C and RH 70-90% Duration: 20 days

Damage: by both adult and larvae

i. Larvae move freely among the foodstuff feed on damaged and mouldy grains
ii. Larvae is very much sensitive to low moisture.
iii. Damage cause heating of commodity which result in mould growth.

Saw-Toothed Grain Beetle



Flat Grain Beetle

Feeding strategy: Secondary Pest

Commodities attacked: Grain and grain products, oilseeds, nuts, dried fruit root crops

Identification:

i. Small beetle, 1.5-2 mm long reddish brown
ii. Highly flattened with long antennae (length equal to body)
iii. Head and prothorax together make half of the body length

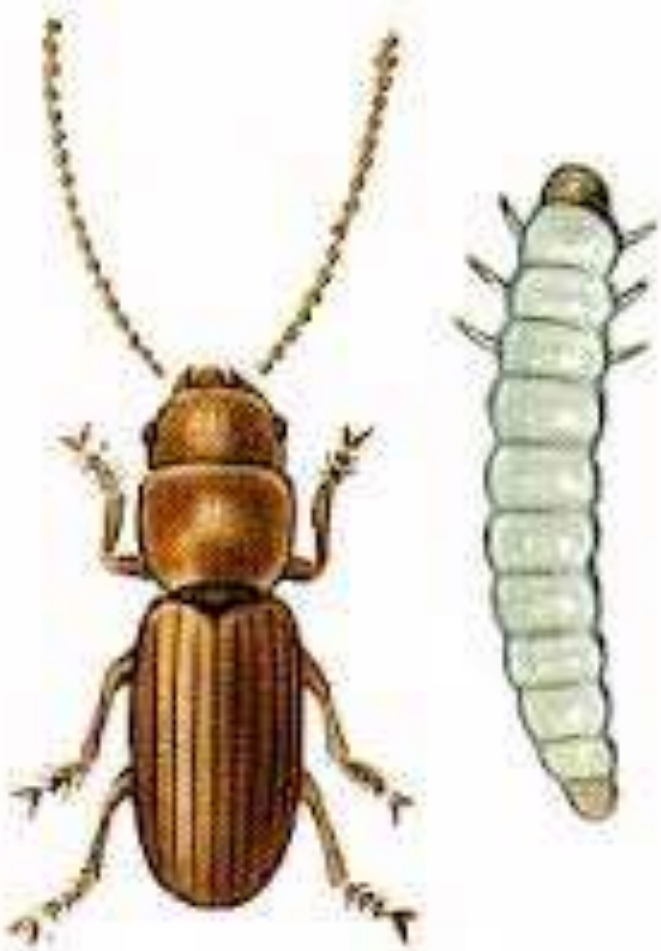
Optimum Conditions:

Temperature 35°C and RH 90% Duration: 22 days

Damage: by both adult and larvae

i. Larvae preferably feed on grain germ.
ii. Larvae burrow into the endosperm or germ
iii. Adult long-lived and feed on grain and grain product.

Flat Grain Beetle



9. Flat grain beetle

Dried Fruit Beetle

Feeding strategy: Secondary Pest, mould feeder

Commodities attacked: Dried fruits

Identification:

i. Oval flattened beetle, 2-4 mm long
ii. Light brown to black
iii. Elytra short and leave last two or three abdominal segments exposed and also with two yellowish or reddish marks.
iv. Antennae with round club

Optimum Conditions:

Temperature 32°C and RH 90% Duration: 12 days

Damage: by both adult and larvae

i. Larvae burrow into soft and mouldy parts of the fruit
ii. Warm and damp conditions favour their rapid development.

Dried Fruit Beetle

Angoumois Grain Moth

Feeding strategy: Primary Pest

Commodities attacked: Cereal Grains

Identification:

i. Wings are pale greyish brown, 5-6 mm long
ii. A small black spot in the centre of forewing
iii. Wings are heavily fringed with fine hairs

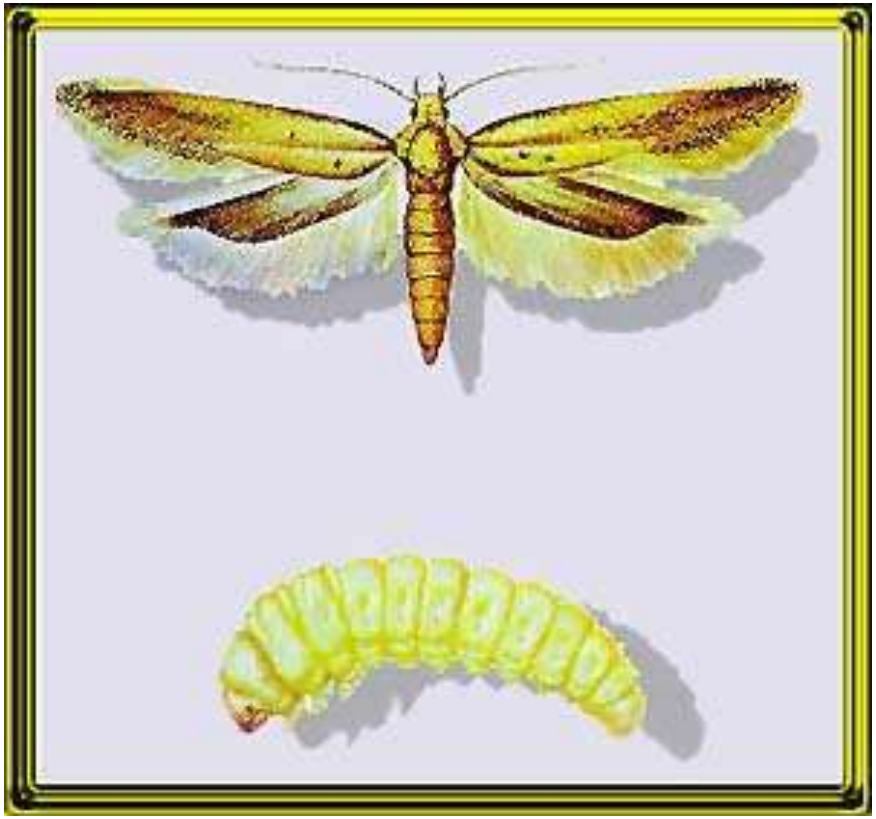
Optimum Conditions:

Temperature 30°C and RH 75% Duration: 30 days

Damage: by larvae (internal feeding)

i. Larval feeding results in large cavities in the infested grains
ii. Larvae make an emergence hole (emergence window) before pupation
iii. Pest is prevalent in warm temperate-tropical

Angoumois Grain Moth



Pyralid Moth or Rice Moth

Feeding strategy: Secondary Pest

Commodities attacked: Grains and grain products, oilseeds, nuts, herbs, spices, dried fruit

Identification:

i. Wings are greyish without any markings, 8-13 mm long
ii. Labial palpi curved downward
iii. Wings without any fringe of hairs

Optimum Conditions:

Temperature 30°C and RH 75% Duration: 27 days

Damage: by larvae (internal feeding)

i. Larval when feeding on whole grains, then prefer on germ and bran.
ii. Larvae produce large amount of silk which bind and foul the infested commodity
iii. Infested food become contaminated with silk, frass, cast skins, pupal cases and dead moths

Pyralid Moth or Rice Moth