



INTRODUCTION TO INSECT AS PESTS OF STORED PRODUCTS

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Cereal

Cereal is a grass cultivated for the edible components of their grain, composed of the endosperm, germ, and bran.

e.g. wheat, rice, maize, barley etc.

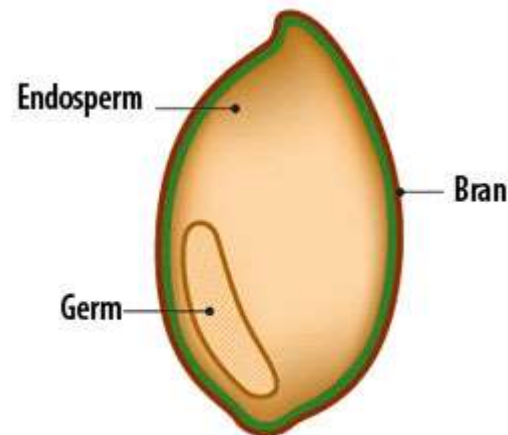
GRAINS

The fruits of cereal grasses especially after been harvested, considered as grain

What is a “whole grain”

The entire cereal grain seed or kernel

The bran (fiber), the germ (vitamins and minerals), and the endosperm (protein)



STORAGE

Storage means the phase of the post-harvest system during which the grains or grain products are kept in such a way as to guarantee food security, maintain food quality, quantity and minimizing the food spoilage, losses and pest infestation.

Objectives of Grain Storage

- At the food level, to permit the continuous supply for human consumption as per demand ;
- At the agricultural level, to ensure availability of seeds for the next crop sowing/ raising;
- At the agro-industrial level, to guarantee regular and continuous supplies of raw materials for processing industries;
- At the marketing level, to balance the supply and demand of agricultural products, thereby stabilizing market prices.

In order to attain these general objectives, it is obviously necessary to adopt measures aimed at preserving the quality and quantity of the stored products over time.

Pest

Any organism which competes with human for the basic necessities of life (Food, shelter and clothing) and which is harmful, detrimental and always cause the economic loss

e.g. Insect pests, fungal pests, bacterial pests, weed pests, stored grain pests, rodent pests.

Stored Food

- i. Cereals and cereal based products
- ii. Whole and milling cereals
- iii. Pulses
- iv. Legumes
- v. Oilseeds
- vi. Nuts
- vii. Dried fruits
- viii. Spices and herbs

Stored Food Insect Pests

Mostly Coleopterans (Beetles and Weevils) and Lepidopterans (Moths)
Insects cause damages to stored food

Stored Food insect pests can cause:

Direct Damages

- Actual food consumption
 - loss of weight,
 - loss of nutrients,
 - lower germination,
 - reduced grade
 - lower market value
- Food contamination
- Damage to storage structures or containers

Indirect Damages

- Grain heating
- Fungi (Micotoxins)
- Aflatoxins
- Control and application costs
- Excessive pesticide residues(risks to health, safety and environment)
- Loss of consumer confidence (Restriction of trade and rejection by consumer)

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.