

### **3.0 FACTORS AFFECTING CROP STORAGE**

Storage deterioration is any form of loss in quantity and quality of bio-materials. The major causes of deterioration in stored could be physical, chemical & biological in nature. These factors include:

- Micro organisms
- Insects and mite
- Birds, pests rodents
- Metabolic activities
- Environmental factors

It is advisable to start storage with quality food product. Storage only preserves quality. It never improves quality. Product with initial poor quality quickly depreciates.

#### **3.1 Micro organisms**

Major micro organisms associated with storage include fungi, bacterial and yeast. The activities of micro organism result in color degradation, off flavor, moisture upgrading, wet spot & moldiness, loss of viability, etc

Fungi are parasite to stored products. They deteriorate stored products and also cause diseases to consumers. The class of fungi mostly important in crop storage is mould. They cause hot spot and increase the moisture content of stored product. When uncontrolled, deterioration is rapid resulting in loss in viability of seed, off-flavour which renders the grain unfit for milling and malting. They also produce mycotoxins which are toxic both to man and animal. They cause discolorations, moistness, biochemical changes and loss in weight. Fungi and bacteria prefer acidic concentration for growth. At high temperature (20%) yeast could ferment soluble carbohydrate to form alcohol and organic acid.

#### **3.2 Insects and Mites**

Generally, insects have short life span but since they reproduce in storage, they continuously increase in number. Weevils are the commonest grain insects. Insects and mites attack both the crop and the storage structure. Female insects bore the seeds and lay eggs in the seeds. Insects consume the stored product; contaminate them with fragments and faeces. They reduce crop weight, quality, nutritional value and viability. They introduce ill-smell to product. Insect could cause the temperature of stored product to increase up to 42°C (108F). This can lead to hot spot.

Grain infesting insects are usually inactive when the moisture and temperature are not above 9% and 40F respectively. Sources of insect infestation include residues from the previous year(s); the infested store; crops can be infested from the field; rodents are also insect carriers. Control measures against insect infestation include chemical control; cleaning of grains; adequate drying; and gas sealed storage. Correct dosage of chemicals must be used to avoid contamination. Old stock grains should not be mixed with new stock. The storage facility and the immediate environment should be disinfested with insecticide.

Insects, mites and pests attack both the stored material and wooden components of the storage structure. Weevils are the commonest insects in grains. They attack seeds and bore through them, and lay eggs in the seeds and storage structures. They reduce seed weight, quality, nutritional value and viability.

### **3.3 Birds, Pest and Rodents**

Birds feed on grains especially when shelled. Birds mostly infest grains on the field where they are exposed. Birds only cause a loss in weight (quantity) and do not seriously affect the quality of grains.

Rodents are animals (mostly mammals) that parasite crops. In attempt to get to the stored product they can destroy buildings, storage structures and some other valuable materials on the farm. Rodents eat the germ of grains and waste the remaining parts. Rodents are vectors (disease carrier) in most cases. They contaminate stored crops with their faeces. Some rodents die in the store and decays hence initiating the rapid growth of micro-organism. The existence of rats can be identified by droppings; loose earth from burrowing; foot print and dusty floor holed sacks with grains, droppings and gnawing damage to woven fabric.

Control measures for rodent that have been practiced include keeping cats and dogs near the store; environmental sanitation; use of rodent proofing such as guard; elevating the storage floor (at least 50cm for concrete floor and 75cm for metal or wooden floor; use of traps and chemical control. It is advisable not to place bicycle or any object which rat can climb against the storage structure.