Physical factors for multiplication of stored grain insect pest

Physical factors

- Temperature
- Moisture
- Relative humidity
- Combine effects of temperature and moisture in insect development
- Combine effects of temperature and moisture in insect behavior
- Light
- Physical form of food, packaging and storage structures
- Air flow
- The effects of insect infestation upon the environment

Temperature

Quantitative effect upon the insect development

High temperature

- Increase
  - Rate of development
  - Activity
  - Rate of population growth
- But lower the mortality

Low temperature

- Decrease
  - Rate of development
  - Activity
  - Rate of population growth
- But higher the mortality

- **Stored grain insect pests have optimum temperatures in the range 25-35°C for their growth and development.**
- **High and low extremes also lethal for the insect pest.**

Moisture

- **Low moisture** contents rate of development of insect pest
- **High moisture** development of insect pest

- Low moisture c cessarily kill the insect rapidly as they may survive with a much reduced rate of development.
- High moisture may leads to the fungal growth too.

Relative humidity

- Equilibrium exits between grain moisture and RH.
- At surface, R.H is low as compare to depth.
- But at the depth R.H is controlled by moisture content of grains.

So at the surface R.H is low, insect suffer from desication.

Combine effect of temperature and moisture on insect development

Different combination of the two factors act to produce combination of conditions , which favor multiplication of different species having different temperature and moisture

Combine effect of temperature and moisture on insect behavior

- Adverse conditions may found in some part of the store.
- Ambient R.H become low during dry season.
- At night temperature become low.

Insect and their stages do not allow to be continuously exposed to adverse condition, so move to seed out more suitable places inside the store to breed.

Light

- Life cycle completion inside the grain, no light.
- Rely on tactile and olfaction.
- The peak activity period of the moth pest is night time.
- Moth are capable for Completing their lifecycle in Darkness, and are attracted Towards light.
- So light trap for control

Physical form of food, packaging and storage structures

- Surface and space between bag, permit the to move in hole storage structure
- Jute bag  and woven polythene  do not inhibit the moment

Tribolium castaneum may tend to congregate near the surface.

Rhyzopertha dominica disperse evenly through a bulk

Cracks and crevices may provide the breeding places to insect pests

Air flow

- Micro-climate modification is affected by insect respiration and multiplication.
- Fungal growth
- So air movement, moderates the internal conditions of storage structures…….

The effects of insect infestation upon the environment

- During metabolism, insect produce heat and liberates water.
- Area become more warmer and wetter, where the infestation of insect occur.
- Hotspot…..
- The grain also releasing the moist air upward to cooler region where it condenses and in extreme condition, causes the rapid spoilage of the grains.

Insect are therefore, capable of modifying their environment as a result of their metabolic processes.