

Management of Storage Insects

What are storage insects?

Storage insects are pests which cause losses through a combination of feeding, spoiling and contamination of both paddy and milled grain.

Why is managing storage insects important?

Consumers are increasingly demanding grain that is free from live insects and free from chemical residues. The management of stored grain pests should be done in a sequential and integrated manner. An effective pest control system involves 1. harvesting, drying and storage of clean dry grain; 2. disinfecting the storage system; and 3. controlling or preventing pest infestation during the storage period.

Storage insect management options

1. Harvesting, drying and storage

Harvest and thresh at the correct stage of maturity (20-25% moisture content)

Dry grain to at least 14% moisture (wet basis) and seed grain to 12% moisture before storage. Prevent delay in drying. Dry at a rate and temperature that will not damage the grain. When sundrying follow recommended sun drying procedures.

Preferably **store** grain as paddy or rough rice as this is less susceptible to insect attack than milled rice. Parboiled rice is also less susceptible to damage than raw rice. New grain should not be stored near older grain unless all insects have been eliminated from the older grain.

Use adequate grain **stores** with the following features:

- A damp proof floor, waterproof walls and roof.
- Possibility to seal the storage for fumigation. This also helps exclude rodents and birds.
- Bag storage: Stack the bags on pallets at least 50cm away from the walls.

Hermetic storage systems proved to be effective:

- In the sealed atmosphere the insects utilize the O₂, expire CO₂ and within 10-15 days die through suffocation and dehydration.
- The moisture content of the grain and storage environment remains constant.
- The grain is protected from rodents and bird.

2. Disinfecting the storage system

Systematically and thoroughly clean all sources of infestation before storage. Old grain residues in the storehouses, grain bins, harvesting and threshing equipment should be treated, removed or destroyed.

Storage containers, structures and equipment can be treated with:

- Malathion (50EC) at 5ml/20l of water @20ml/m²
- Fenitrothion (50EC) at 5ml/l water @20ml/m²
- Deltamethrin (2.5% WP) at 1.5g/l water @20ml/m²

If thorough cleaning is not possible, the containers may need to be sealed and fumigated with phosphine. All second hand bags should be examined and where necessary treated with either a fumigant, insecticide or dipped in boiling water or in the above solutions.

3. Controlling infestations within the grain

Determine the level of infestation and then select an appropriate method for control. If there are more than 4 insects per kg found some form of treatment is required.

- Malathion: A safe organophosphate insecticide, which is not highly toxic humans, does not penetrate piles of grain and breaks down fast in the tropics.
- Phosphine fumigation: Using tables and pellets. As a gas highly toxic to insects and humans. Fumigate in sealed enclosure. After fumigation grain must be aerated and the bin checked for residual gas before entry.
- CO₂ fumigation: Replaces oxygen and suffocates insects. Not highly toxic. Must be applied until all insects died. High cost.

Always check with buyers to ensure that the pest control methods intended for use will be acceptable.

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