Management of Storage Fungi

What are Storage Fungi?

Storage fungi usually invade grain or seed during storage and are generally not present in large quantities before harvest in the field. The most common storage fungi in rice are species of Aspergillus and Penicillium. Contamination occurs through spores contaminating the grain as it is going into storage from the harvest, in handling and storage equipment or from spores already in the storage structures. Under high temperatures and moisture this small amount of inoculums can increase rapidly. The development of fungi is influenced by the:

- Moisture content of the stored grain
- Temperature
- Condition of the grain going into storage
- Length of time the is grain stored and
- Amount of insect and mite activity in the grain.

Why is fungi management important?

Fungi cause two distinct problems in storage grains: Grain spoilage from fungal growth or molds and the production of poisonous mycotoxins. While the losses from spoilage may be of greater economic significance, they are less dangerous than the presence of mycotoxins.

Grain spoilage causes

- Poor germination
- Loss of weight
- Loss of nutritive value
- Poor milling quality
- Deterioration in flavor
- Discoloration

Mycotoxins

- Poisonous chemical compounds produced by certain storage fungi.
- These fungi are not common in but were isolated from rice.

Management options

Avoidance

The most effective method of preventing mycotoxin problems is avoidance. This is possible by drying the grain to quickly before storage, reducing physical damage to the grain and by ensuring clean, dry insect-proof storage conditions.

Safe Storage Conditions

Fungal infestation will be reduced when grain and seed is:

- Stored at moisture contents below 13-14%.
- Stored at temperatures below 20^{o}C and above 40^{o}C.
- Free of damaged kernels or foreign material.
- Free from fungi coming into store.
- Stored for a shorter period.
- Free from insect and mites.

Grain treatment

Apply physical or chemical treatment or both to infected seeds:

- Seed borne bacteria can be treated by dry heat at 65^{o}C for 6 days or dipping in hot water treatment at 52-55^{o}C.
- Seeds can also be treatment with fungicides such as Dithane M-45 and Benlate at the rate of 3 grams kg^{-}1.

Minimize Damage

All crops are infested by a certain amount of storage fungi in the field. The following recommendations should help prevent storage fungi problems or minimize damage from storage fungi in storage.

- Harvest as soon as the moisture content allows.
- Set the harvesting equipment for minimum kernel damage and maximum cleaning.
- Clean all grain harvesting, handling equipment and storage facilities thoroughly before beginning to harvest.
- Clean grain going into storage.
- Avoid delay in drying after harvest. Don't field dry.
- Aerate grain equalize temperatures and moisture content through the grain mass.
- Protect grain from insect and mite damage.
- Check stored grain regularly, aerate as needed to maintain low moisture and temperature.

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