

Grain Storage

Rice storage facilities take many forms depending on the quantity of grain to be stored, the purpose of storage, and the location of the store. In general, it is recommended that rice for food purposes be stored in paddy form rather than milled rice as the husk provides some protection against insects and helps prevent quality deterioration. However when rice can be stored as brown rice, 20% less storage capacity will be needed

Requirements

The requirements for a good storage system include:

- Prevention of moisture re-entering the grain after drying
- Protection from insects, rodents and birds
- Ease of loading and unloading.
- Efficient use of space
- Easy to maintain and manage.

Rice grain is hygroscopic and in open storage systems the grain moisture content will eventually equilibrate with the surrounding air. High relative humidity and high temperatures contribute to high equilibrium or final moisture contents. In many tropical countries, the equilibrium moisture content is above safe storage moisture levels.

Safe storage conditions for grain

Safe storage of rice for longer periods is possible if three conditions are met:

- Grain is maintained at moisture levels of 14% or less and seed is stored at 12% or less
- Grain is protected from insects, rodents and birds
- Grain is protected from rewetting by rain or imbibing moisture from the surrounding air;

The longer the grain needs to be stored, the lower the required moisture content will need to be. Grain and seed stored at moisture contents above 14% may experience the growth of molds, rapid loss of viability and a reduction in eating quality. The following table shows the 'safe' moisture content required for different storage periods.

| Storage period | Required moisture content for safe storage | Potential problems |
|------------------|--|--|
| 2 to 3 weeks | 14 – 18 % | Molds, discoloration, respiration loss |
| 8 to 12 months | 12- 13 % | Insect damage |
| More than 1 year | 9 % or less | Loss of viability |

A rule of thumb for seed is that the life of the seed will be halved for every 1% increase in moisture content or a 5 C increase in storage temperature.

For more information contact

Agricultural Engineering Unit
IRRI, DAPO Box 7777, Metro Manila, Philippines
Tel.: (63-2) 580-5600, Fax.: (63-2) 580-5699
Email: M.Gummert@cgiar.org
J.Rickman@cgiar.org