

Paddy drying systems



www.rkbassam.in

Introduction

Importance of drying the paddy correctly

Rice is usually harvested at grain moisture content (MC) between 24 and 26% (wet basis). Any delays in drying, incomplete drying, or uneven drying will result in qualitative and quantitative losses .

- Improper drying causes high percentage of damage in head rice.
- Reduced milling yields and more broken percentages caused by high temperatures and re-wetting of grains.
- Loss of germination and vigor from grain respiration, mold and insect activities, or exposure of grains to temperatures above 42°C.
- Damage caused by insects which are more active at higher MC levels.

Some recommendations on drying the paddy

- Dry the grains/seeds after threshing of paddy. Avoid field drying of paddy in bundles.
- Clean the grains before drying to avoid uneven drying and wet spots.
- Dry the paddy to 14% moisture content for milling purpose, so the grain weight and milling yield won't decrease.
- When storing grains for 8-12 months, dry the grains 12-14% MC.
- When storing seeds for 8-12 months, dry the grains 9-12% MC
- Do not mix grains maintained at different MCs to avoid cross contamination.

Methods of drying the paddy

A. Sun drying - Sun drying continues to be the preferred drying method in Asia because of its low cost. It is labor intensive and control of grain temperature is difficult.

For optimum quality:

- Spread the grains in thin layers (3-5 cm)
- Spread the grains over a tarpaulin sheet to avoid moisture gain from surface and minimize losses.
- Cover or collect the grains during rain
- Mix frequently, at least every 30 minutes
- Monitor the grain temperature and moisture content
- Shade or cover when grain temperatures are above 50°C
(42°C for seeds)

B. Solar bubble dryer -- for farmers, contractors, small rice mills. Capacity: 0.5-1 t/batch. Drying time: 6-8 h. Took 2 days during rainy reason. Protect grains from rain transform solar energy into heat Lead the drying air over the grains

Heated air drying

C. Flat Bed Batch Dryer - for farmers, contractors, small rice mills. Capacity: 4-10 t/batch. Drying time: 6-8 h

Rice husk furnace
Air velocity 0.2m/s
Drying air temp. 43°C
Bulk depth 30cm
Drying rate 1-1.5%/h

D. Re-circulating Batch Dryer - for rice mills and cooperatives. Capacity: 4-10 t/batch. Drying time: 6-8 h.

- Pros: Even drying, automatic operation, affordable
- Cons: Wear of mechanical components

E. Continuous Flow Dryer - for large commercial facilities. Capacity: ~10 t/hour. Drying rate: 1-2% pass

- Pros: High capacity, automatic operation
- Cons: Capital intensive, requires large volumes

