

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 .

- Yellowing or discoloration caused by mold development and heat build-up from respiration.
- Reduced milling yields 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

- Clean the grains before drying to avoid uneven drying and wet spots.
- Dry the paddy immediately after harvest; dry to 18% MC if the paddy will be stored for a maximum of two weeks.
- When drying for milling, target 14% MC so the grain weight and milling yield won't decrease.
- When storing grains for 8-12 months, dry the grains up to 13% MC or less.
- For long term storage (1 year or more), dry to 9%.
- Do not mix grains maintained at different MCs to avoid cracking.
- Always monitor the grain temperature and MC to prevent the grains from being exposed to excess temperatures and over-drying.

Methods of drying the paddy

A. Sun drying - Sun drying continues to be the preferred drying method 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 (5 cm)
- Cover or collect the grains during rain
- Mix frequently, at least every 30 minutes
- Monitor the grain temperature
- Shade or cover when grain temperatures are above 50°C (42°C for seeds)

B. In-store drying - Paddy with MC below 18% can be slowly dried in storage bins using aeration with slightly pre-heated air (3-6K above ambient temperature).

Farm to commercial level, capacity depends on storage structure.

Drying time: days to weeks

- Pros: Good quality, low energy usage, storage included
- Cons: Second stage dryer, long drying time

Heated air drying

C. Fixed Bed Batch Dryer - for farmers, contractors, small rice mills. Capacity: 1-10 t/batch. Drying time: 6-8 h

- Pros: Simple, cheap, local versions available
- Cons: Uneven drying, labor intensive

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

