

# PADDY DRYING SYSTEMS

## Introduction

Rice is normally harvested at a grain moisture content (MC) between 20 and 30% (wet basis). Delays in drying, incomplete drying or uneven drying will cause losses in both quantity and quality of grain. Poor grain drying techniques result in:

- Yellowing or discoloration caused by mold development on heat build-up from respiration
- Reduced milling yields caused by high temperatures and re-wetting of the grain
- Loss of germination and vigor caused by grain respiration, mold and insect activities, or exposure of grains to temperature above 42°C
- Damage caused by insects that are more active at high moisture content.

## Drying Methods

### Sun Drying

Sun drying is the preferred drying method in Asia.

- Low cost
- Labor intensive
- Difficult to control grain temperature



### In-store Drying

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



- Farm or commercial level
- Capacity depend on storage structure
- Drying time-days to weeks
- Good quality grain
- Low energy usage
- Used as second stage dryer
- Long drying time

### Heated Air Drying

#### Fixed Bed Batch Dryer

- For farmers, contractors, small rice mills
- Capacity: 1-10 t/batch
- Drying time: 6-8h
- Simple and cheap
- Local versions available
- Uneven drying
- Labor intensive



#### Re-circulating Batch Dryer

- For rice mills and cooperatives
- Capacity: 4-10 t/batch
- Drying time: 6-8h
- Gives even drying
- Automatically controlled
- Affordable
- High wear of mechanical components



#### Continuous Flow Dryer



- Large commercial facilities
- Capacity: ~10 tons/hr
- Drying rate: 1-2%
- Automatically controlled
- Capital intensive
- Requires large volumes of grain

## Recommendations

- Clean the grain before drying to avoid uneven drying and wet spots.
- Dry paddy immediately after harvest to below 18% MC. This will give safe storage for up to two weeks.
- Dry paddy for milling to 14%. Drying below 14% reduces weight and milling yield.
- Periods of 8-12 month dry to 13% or less.  
Long term storage exceeding 1 year to dry 9-10%.
- Do not mix grain with different MC. This is to avoid cracking.
- Monitor grain temperature and MC to prevent excess drying temperatures and over-drying.

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