

Grain Drying

Sun Drying

What is Sun Drying?

Sun drying is the traditional method for reducing the moisture content (MC) of paddy by spreading the grains in the sun. The solar radiation heats up the grains as well as the surrounding air and thus increases the rate of water evaporating from the grains.

Why Sun Dry?

Sun drying is the most common drying method in Asia because of its low cost compared to mechanical drying. It requires little investment and is environmentally friendly since it uses the sun as the heat source and therefore produces no CO₂.

How to Sun Dry?

- Spread the grains in thin layers, ideally 2-4 cm but less than 5cm.
- For faster drying place the grains/panicles in well-aerated or windy areas.
- Mix grain frequently (at least every 30 minutes).
- Monitor grain temperature and MC using thermometers and moisture meters.
- Shade or cover the grain when grain temperatures are above 50°C (42°C for seeds).
- Collect or cover the grain during rain and at night (when grain rewets it cracks)
- To minimize cracking use sundrying for first-stage drying (i.e., removal of water from the outer layer of the grain) to 18% MC. Such grain can be safely stored for 2 weeks. Then use other drying systems for drying from 18 to 14% MC.
- Keep animals off the grain.
- Avoid drying grain on public roads as the grain gets dirty, traffic is hindered and it can cause accidents.

Limitations of Sun Drying:

- Not possible during rain or at night. Delays in drying lead to excessive respiration and fungal growth causing grain losses and yellowing.
- Labor intensive and has limited capacity.
- Temperature control is difficult. Overheating of grains can result in low milling quality caused by cracked grains.



Using the sun to dry your grain requires little investment and is environmentally friendly.

For more information...

On post-harvest management, visit the Rice Knowledge Bank at <http://www.knowledgebank.irri.org>. For an overall view of crop management practices, visit <http://www.knowledgebank.irri.org/tropRice>. To diagnose problems in the field visit <http://www.knowledgebank.irri.org/ricedoctor>.

Developed with input from M Gummert, JF Rickman and MA Bell.

Options for Sun Drying

1. Field Drying

Use: Traditional method for pre-drying hand harvested crops before threshing.

- How: Place cut plants on the ground or on racks.
- Problems: 1) At night grains re-wet from the soil and from wet straw, 2) Limited air circulation and drying.

Field drying: Potential for rapid reduction in grain quality!



2. Panicle Drying

Use: Traditional, small-scale method for farmers.

- How: Place tied bundles of panicles on pavements or mats or hang them from frames.
- Problems: 1) Need manual harvesting of panicles, 2) uneven drying as grains inside panicle dry slower than grains outside.



3. Drying on Nets, Mats or Canvas

Use: Small- to medium-scale method for farmers, groups, and contractors.

- How: Place threshed grain on nets mats or canvas. A hygienic method that allows quick collection and mixing.
- Problems: 1) Re-wetting and pollution from the ground when using nets, 2) some costs for net, mat or canvas.



4. Drying Pavement

Use: Medium- to large-scale for grain collectors, traders and millers.

- How: Place threshed grain on pavements made specifically for drying. Mixing and collecting can be partially mechanization. Due to large size, labor can be more effectively used.
- System can be improved by using pavements with elevations for the grains and drainage channels for rainwater.
- Problem: 1) need capital for pavement, 2) contamination of grain from stones and dirt.

