

# Development of a small unhulled rice-dryer suitable for use in the Mekong Delta

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## Objectives

The Mekong Delta is Vietnam's largest rice producing region. During the rainy season harvest time, conventional sun-drying methods can cause the quality of unhulled rice to deteriorate. Problems also arise during days of intense sunlight, when drying occurs too quickly and causes grains to crack. To assist cultivators in drying their rice in a more efficient and consistent fashion, researchers developed an all-weather, easy-to-use compact dryer that can dry approximately two tons of unhulled rice without deterioration and cracking.

## Results

This dryer operates using a honeycomb coal furnace, air blower fan, and driving engine with slanted drying layers on both sides. Since the drying layers are located at a low position, it is easy to hold, mix and take out unhulled rice. An easily prepared weather protection tent allows users to continue to conduct drying even during sudden rainfall (Fig. 1 and Table 1). When the dryer is installed outdoors on an uneven surface, users must ensure that air does not leak from the ground plane.

Two tons of unhulled rice can be dried in approximately 13 hours with 25 percent initial moisture content without adverse effects. Drying can generate uneven moisture on the upper and lower layers of dry unhulled rice. However, this moisture can be reduced if the drying speed is increased by mixing and agitating the rice after five hours of operation. Since four people and approximately four hours are needed to complete the entire process of assembling, drying, and removal, one-time mixing and agitation is sufficient.

Fuel costs for honeycomb coal and light oil are approximately 74,000 VND (about 620 yen) per one ton of dry unhulled rice. The dryer is priced at 6,500,000 VND (about 54,000 yen), excluding the weather tent. Forty units are currently in use, primarily in the Mekong Delta area.



Fig. 1. Unfulled rice dryer.

Table 1. Dryer specifications.

Drying layer	width (mm)	2,900
	length (mm)	4,000
	height (mm)	700
	depth (mm)	280
Fan blower	fan diameter (mm)	450
	blowing capacity (m <sup>3</sup> /s)	2.0
Heat source	honeycomb coal	2 sets
Driving engine		diesel
Rainout tent	width × length (m)	4 × 6

## References

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