

Abstract

Drying processes result in some loss of product quality. Three drying systems for paddy were investigated for their effects on head-rice yield and whiteness. Fluidised-bed drying, tempering and ambient air ventilation units were the main components, but they were arranged differently in each drying system. Heat- and mass-transfer equations were applied to predict the change in moisture content for each drying system. Both the experiments and simulations indicated that the two sub-drying systems (system No. 2) with tempering and ventilation as elements of each stage yielded higher drying capacity and thermal efficiency than the single drying system (system No. 1), in which paddy was treated with the drying, tempering and ventilation units only once. The proportion of full kernels and value of the whiteness obtained from both drying systems were not significantly different. System No. 3, where grains after the first tempering were dried immediately by the second fluidised-bed dryer with no ventilation unit, produced poor head-rice yield and colour and was unacceptable for producing white rice.