

Title Drying of high moisture paddy by two-dimensional spouted bed technique.

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Abstract

The objectives of this research were to design and construct a two-dimensional spouted bed dryer with draft plates, to study drying kinetics of paddy, paddy quality and specific primary energy consumption. Experimental drying conditions were as follows: initial paddy moisture contents (M_i) of 31.1-45.6% dry basis (d.b.), inlet air temperatures (T_i) of 130, 140 and 150°C, hold-ups (H) of 20, 25 and 30 kg. Experimental results showed that minimum spouting velocity of drying air at the inlet of drying chamber was 15.4-16.4 m/s equivalent to velocity through the draft plates of 3.9-4.1 m/s. The operating parameters affecting drying rate and specific primary energy consumption were drying temperature and specific air flow rate or hold-up. Those affecting head rice yield and rice whiteness were initial and final moisture contents of paddy and drying air temperature. The entrance height directly affected energy consumption of the fan. The suitable entrance height was 10 cm as it resulted in minimum energy consumption. The first order polynomial equation was accurate and appropriate for predicting drying rate.