Performance Evaluation of IPHT Small Scale Dryer for Parboiled Paddy

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Abstract

Parboiling is a hydro-thermal treatment given to the paddy before milling. The popular method of drying parboiled paddy is sun drying. Under tropical climatic conditions, high rain fall is seriously affected on sun drying. Therefore further development is necessary to improve the mechanical drying systems. In this research, a study on small scale dryer for parboiled paddy which was designed and fabricated at Institute of Post Harvest Technology in Anuradhapura was done. The report describes the dryer performance. Three batches of parboiled paddy were dried under in small scale dryer with forced hot air at 45^{0}C and one batch under sun drying. Dried grains were subjected to milling under the unique machine conditions and it was tested for the qualities of grain. It was found that 12kg/h in fuel consumption. The lowest drying time (3h 10min) and highest average drying rate (6.39 %/h) was obtained from 70kg capacity in dryer. The fuel consumption efficiency, average drying rate, drying efficiency, cracked grain and broken grain percentage were observed negatively correlated with capacity of the dryer. It was also observed that there was a correlation between percentage of cracks and percentage of broken grain during milling. This study concluded that, the better grain qualities can be obtained through this dryer than sun drying. Although it has some disadvantages, dryer is very important in rainy season while impossible to practice sun drying. Further considering the results, it can be concluded that 105kg is the most appropriate capacity to achieve optimum performances in drying of parboiled paddy.

Keywords: drying, hydrothermal, parboiling, performance