

Milling Recovery and Quality of Combine Harvested Paddy A Case Study in Batticaloa and Ampara Districts

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ABSTRACT: Grain quality directly affects the profitability of a crop. This study investigated the field operational conditions of combine harvesters with respect to the quality of the grain. A total of six brands of combine harvesters were tested in 10 different fields in Batticaloa and Ampara districts. The damages imposed on grains were determined based on the milling quality of the samples. The holistic view of data from farmers' field trials indicated that the combine forward speed, tip velocity of threshing drums and grain moisture content highly influenced the physical damages caused to the paddy grains during milling. Threshing unit tip velocity of the combine harvesters were found to be in the range of 10.35 – 39.51 m/s. The tip velocity of 10.35 m/s gave the lowest broken percentage of 15.38% and a higher head rice yield of 49.45%. Relatively low percentages of broken rice of 19.32% and 27.45% were obtained at high forward speeds of 1.36 and 2.5 m/s, respectively. This could be due to the creation of cushioning effect on the grains by increasing feed rate. High impacting forces on the grains at increased tip velocities caused the grain fissures which decreased the quality of seed paddy. The lowest grain moisture content of 15.9% yielded a relatively high broken rice percentage of 33.98 kg/ha at the tip velocity of 24.64 m/s. The highest grain damage of 39.94 kg/ha was obtained during milling at the tip velocity of 39.51 m/s at the moisture content of 20.9%.

Keywords: Broken rice, head rice yield, milling, threshing drum, tip velocity

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