

Comparison of field performances between two typical mini combine harvesters in grain corn production

ABSTRACT

A mini combine harvester was efficiently designed and developed to harvest grain corn on a small scale farm in order to reduce manpower and operating time as delayed harvesting leads to grain loss. Two typical mini combine harvesters namely Kubota DC105X (KDC) and World Star 7.0Plus (WS) have been introduced to farmers as high output, low fuel consumption and ease of maintenance in grain corn production. This research was undertaken to evaluate and compare the field performance of KDC and WS mini combine harvester which included the field efficiency (FE), effective field capacity (EFC), fuel consumption (FC), field machine index (FMI) and total field time under similar field condition and soil properties. A time-motion study was conducted during harvesting in two consecutive growing seasons. The mean values of EFC, FE, FC, FMI and total field time for KDC were found to be 0.28 ha/hr, 50.00%, 16.85 l/ha, 0.84 and 3.55 hr/ha, respectively. The mean values of EFC, FE, FC, FMI and total field time for WS were found to be 0.25 ha/hr, 54.35%, 12.57 l/ha, 0.81 and 3.99 hr/ha, respectively. The statistical analysis (ANOVA) shows that there were no significant differences in field performance between both mini combine harvesters at 5% significance level ($\alpha = 0.05$). Both mini combine harvesters had performed with consistent and reliable results in conducting the harvesting. This study concludes that the WS is more efficient than KDC in terms of FE and FC.

Keyword: Corn; Efficiency; Grain; Harvesting; Mechanization; Performance