PERFORMANCE EVALUATION OF THE POWER OPERATED GROUNDNUT DECORTICATOR AT FARM MECHANIZATION RESEARCH CENTRE (FMRC)

H.M.B.H. Herath[1], D.M.S.P. Bandara[2], G.V.T.V. Weerasooriya[1], E.J. Kosgollegedara[1], S. Karthigayani[1] and G.A.M.A. Wijethunga[2]

[1]Department of Agricultural Engineering and Soil Science, Faculty of Agriculture, Rajarata University of Sri Lanka, Anuradhapura, Sri Lanka.
[2]National Institute of Post-Harvest Management, Anuradhapura, Sri Lanka.
[3]Farm Mechanization Research Centre, Mahailuppallama, Sri Lanka.

Decortication of groundnut (*Arachis hypogaea*) pods is one of the essential unit operations required to be performed while processing them into any form of a product. Farm Mechanization Research Centre (FMRC), Sri Lanka, has designed and developed an electrically driven fully mechanized decorticator for groundnut. The machine consists of a threshing drum which provides shearing force to split the pods. Then the split pods move into first and second blowers. The first blower leads to separate seeds and shells, and the second blower helps to clean the decorticated seeds from dust particles. This study was carried out to evaluate the performance of the FMRC groundnut decorticator, which has been not previously evaluated. Well matured and belonging to the popular Sri Lankan variety *Indi,* was selected for the evaluation with three different moisture content of pods, i.e., 10%,15%, and 30% (MC_{wb}). Statistical analysis (one-way analysis of variance) revealed no significant effect of MC_{wb} of the pods on machine capacity ($p \leq 0.05$). However, the groundnut pods with 30% MC_{wb} have significantly higher value decortication efficiency (93.85 ±0.68%) ($p \leq 0.05$) than the other two moisture content. Moreover, broken pod percentage and unshelled pod percentage of groundnut pods at 30% MC_{wb} were 3.32±0.27% and 2.83±0.95%, which were significantly low compared to the pods with 10% and 15% MC_{wb} ($p \leq 0.05$). The decorticator's mean actual machine capacity was 73.37±1.43 kgh^{-1} for 30% MC_{wb} of groundnut pods. Therefore, it can be concluded that optimum decortication efficiency is performed at 30% MC_{wb} of groundnut pods.

Keywords: Broken pod percentage, Decortication efficiency, Machine capacity, Unshelled pod percentage